ADF FOR GP605/605V

SERVICE MANUAL

REVISION 0

Canon

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Prepared by

OFFICE IMAGING PRODUCTS TECHNICAL SUPPORT DIVISION

CANON INC.

5-1, Hakusan 7-chome, Toride, Ibaraki, 302-8501 Japan

INTRODUCTION

This Service Manual contains basic data and figures on the ADF for the GP605/605V needed to service the machine in the field.

CHAPTER 1 General Description introduces the ADF's features and specifications, and shows how to operate the ADF.

CHAPTER 2 Basic Operation provides outlines of the ADF's various mechanical workings, and explains the principles used for the ADF's various control mechanisms in view of the functions of electrical and mechanical units and in relation to their timing of operation.

CHAPTER 3 Mechanical System shows how the ADF's various mechanical workings are constructed, and how the ADF may be disassembled/assembled and adjusted.

CHAPTER 4 Maintenance and Servicing provides tables of periodically replaced parts and consumables/durables and scheduled servicing charts.

CHAPTER 5 Troubleshooting provides tables of maintenance/inspection, standards/adjustments, and problem identification (image fault/malfunction).

APPENDIX contains a general timing chart and general circuit diagrams.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine.

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CHAPTER 1

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I . FEATURES

1. First Page First

The machine helps increase its host copier's productivity (if the copier possesses a reversing mechanism).

2. Pre-Reversing Mechanism

The machine's pre-reversing mechanism adds to productivity when processing double-sided originals.

3. Clip-On Feeding Belt Unit

Compared with the exiting models, the machine's feeding belt can be removed much more easily, facilitating servicing work.

4. Stream Reading of All Sizes

The machine may use stream reading for all sizes (including large size) of originals (for reproduction ratios between 50% and 150%).

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II . SPECIFICATIONS

A. ADF for GP605/GP605V

Item	Specifications	Remarks
Pickup	Auto pickup/delivery	
Original placement	Original tray: face up Manual feeder: face down	
Original position	Original tray: center Manual feeder: rear stop	
Original separation	Top separation	
Original type	Sheet Original tray: 50 to 200 g/m^2 Manual feeder: 38 to 200 g/m^2	However, 163 g/m^2 if large-size, double-sided copies.
Original size	A5 to A3/STMT to 279.4×431.8mm (11"×17")	
Original tray	Small size: 100 sheets A5, A4, B5, STMT, LTR, A4R, B5R, LTRR	For paper of 80 g/m^2 or less.
		For paper of 80 g/m^2 or less.
	Large size: 50 sheets A3, B4, LGL, 279.4×431.8 mm (11"×17")	For paper of 80 g/m^2 or less.
Original delivery tray	Small size: 100 sheets A5, A4, B5, STMT, LTR, A4R, B5R, LTRR	For paper of 80 g/m^2 or less.
	Large size: 50 sheets A3, B4, LGL, 279.4×431.8 mm (11"×17")	
Original processing	Single-sided, double-sided	
Stream reading	Provided (all sizes; single-sided, between 50% and 150%)	
Manual feed	Provided (single sheet only)	
Original size identification	Provided (default sizes only)	
Residual paper detection	Provided	
Size mixing	Provided (same feeding width only)	
Book original	Supported (40 mm or less in thickness)	

Table 1-202-1

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Item	Specifications	Remarks
Communication with copier	IPC communication 2	
Power supply	24 VDC (from copier)	
Weight	21 kg (approx.)	Not including delivery tray.
Dimensions	646 (W) × 569.5 (D) × 143 (H) mm	Not including delivery tray.
Serial No.	A: ZRBxxxxx Inch/A: ZRCxxxxx AB: ZRDxxxxx Inch/AB: ZRExxxxx	
Operating environment Temperature range Humidity range	Same as copier.	

Table 1-202-2

The above specifications are subject to change for product improvement.

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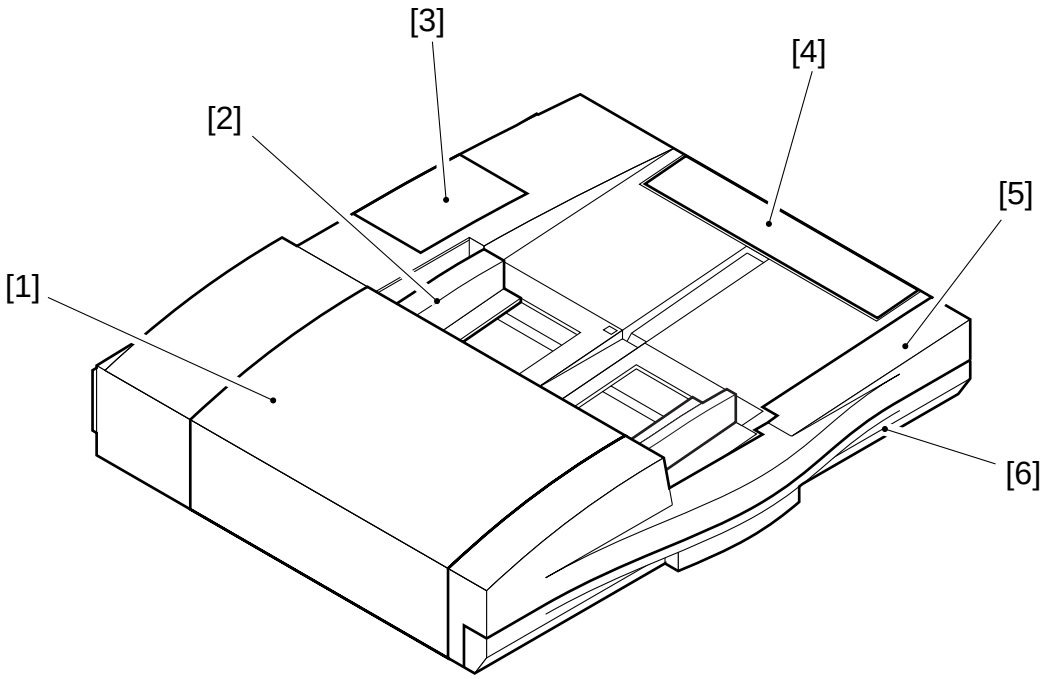
III . NAMES OF PARTS

A. External View



[1] Upper cover
[2] Side guide
[3] ADF controller cover
[4] Manual tray
[5] Upper front cover
[6] Lower front cover

Figure 1-301

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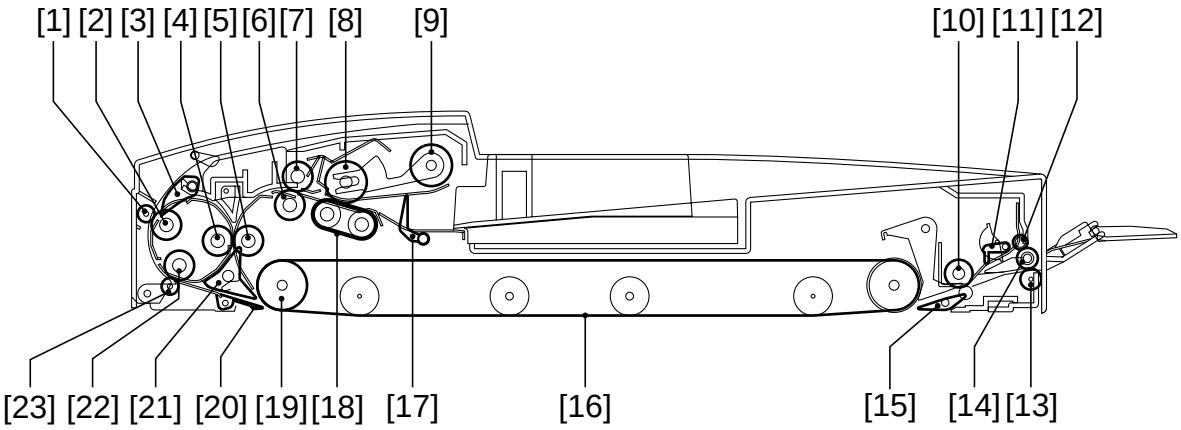
B. Cross Section



[1] Reversing roller B roll
[2] Reversing roller B
[3] Reversing flapper
[4] Registration locking roller
[5] Registration roller
[6] Pull-out roller
[7] Pull out locking roller
[8] Feeding roller
[9] Pickup roller
[10] Manual feed registration roller
[11] Manual feed stopper plate
[12] Delivery roller A roll
[13] Delivery roller B roll
[14] Delivery roller
[15] Delivery jumping flapper
[16] Feeding belt
[17] Stopper plate
[18] Separation belt
[19] Feeding belt drive roller
[20] Jumping flapper
[21] Pre-reversal flapper
[22] Reversing roller A
[23] Reversing roller A roll

Figure 1-302

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IV . OPERATION

A. Original Set Indicator

The Original Set indicator turns on when an original is placed on the original tray, and flashes when an original jams.

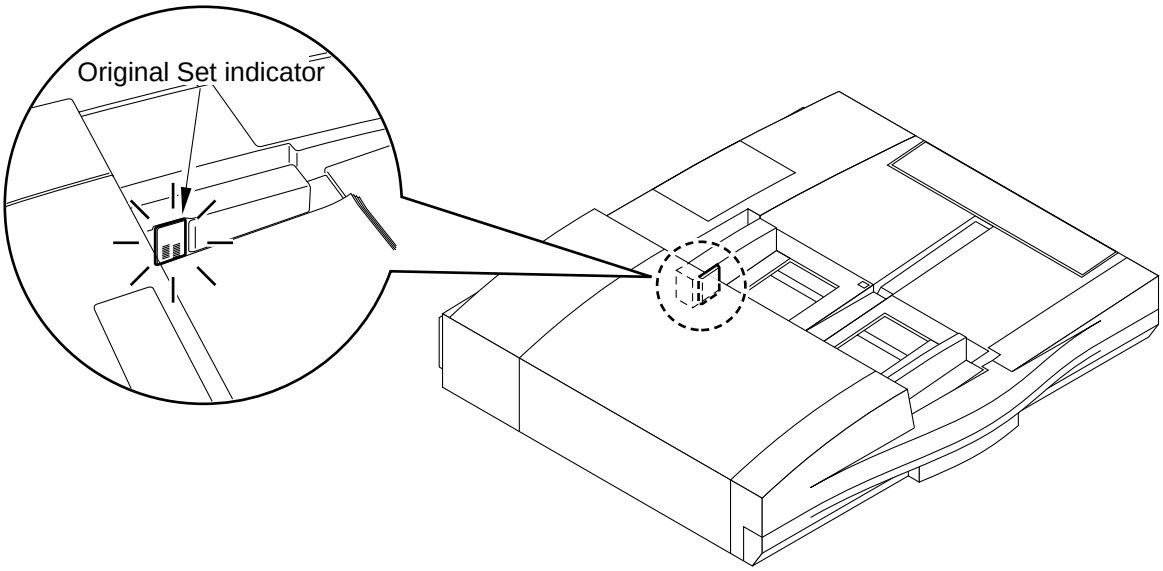

Figure 1-401

B. Warnings and Actions to Take

Suspect a jam if the Original Set indicator starts to flash while an original is being fed. Perform the following steps for correction:

1) Remove all originals from the original tray.
2) Open the upper cover, and remove the jam, if any.
3) Open the ADF, and remove the original, if any, from the copyboard.
4) Put the originals in correct order, and set the stack in the ADF.

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C. Routine Maintenance by the User

Instruct the user to clean the following parts at least once a week.

Parts	Description
Copyboard glass	Wipe it with a cloth moistened with water or alcohol; then, dry wipe it.
Feeding belt	Wipe it with a cloth moistened with water or alcohol; then, dry wipe it.
Registration roller	Execute the copier's user mode.

Table 1-401

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CHAPTER 2

Operations

1. In outline diagrams, ▮▮▮▮ represents mechanical drive paths, and ——→ indicates electrical signal paths.

2. Signals in digital circuits are identified as '1' for High and '0' for Low. The voltage of signals, however depends on the circuit.

Nearly all operations of the machine are contorolled by the CPU; the internal workings of the CPU are not relevant to the service person's work and, therefore, are left out of the discussions. By the same token, no repairs are prescribed for the PCBs at the user's premises; for this reason, PCBs are discussed by means of block diagrams rather than circuit diagrams.

For the purpose of explanation, discussions are divided into the following: from sensors to ADF controller PCB input ports; from ADF controller output ports to loads; and minor control circuits and functions.

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I . BASIC CONSTRUCTION

A. Electrical Circuitry

The machine's electrical mechanisms are controlled by the ADF controller PCB. The CPU on the ADF controller PCB interprets input signals from the machine's sensors and the host copier, and generates signals to drive the motors, solenoids, and other DC loads.

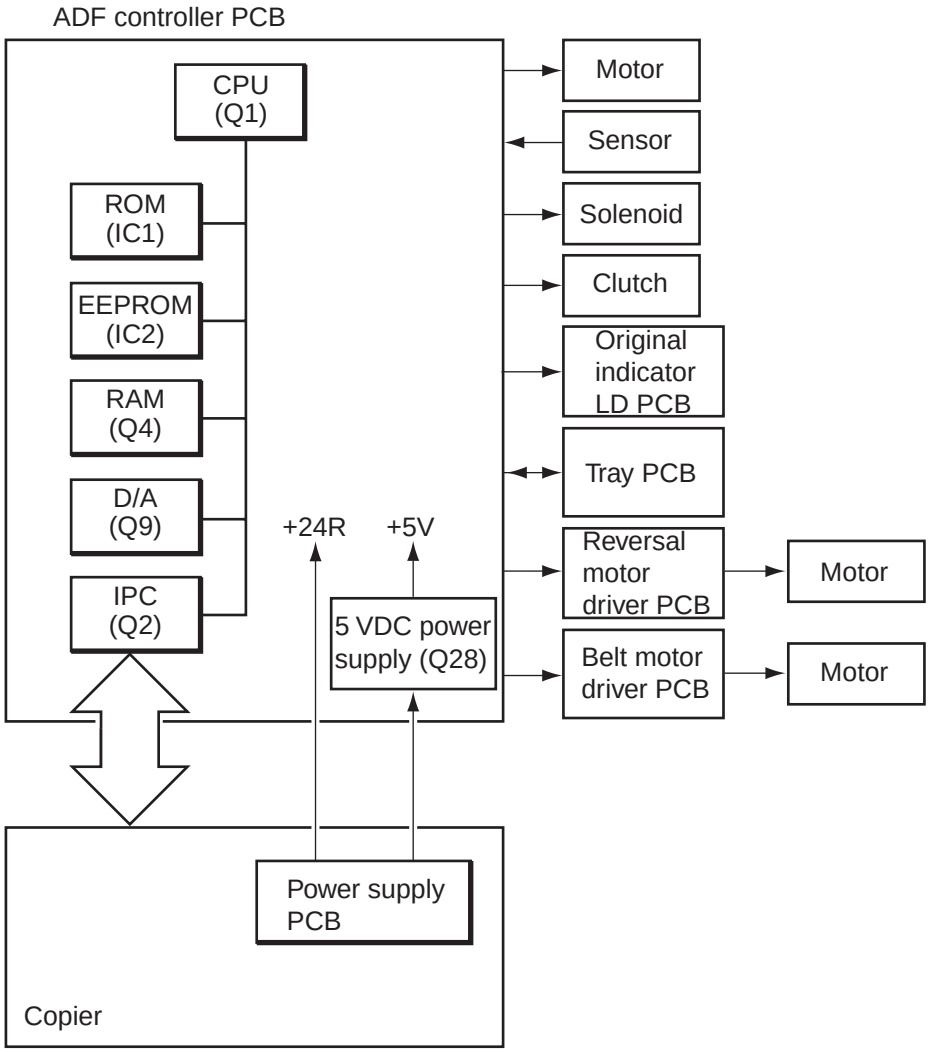

Figure 2-101

B. Communication with the Copier

The machine communicates using IPC communication 2, which enables communication at a higher speed than the existing IPC methods.

Related Error Code

E422 E712	A fault has occurred in the communication with the copier.

C. Inputs to the ADF Controller PCB

Inputs to the ADF Controller PCB (1/2)

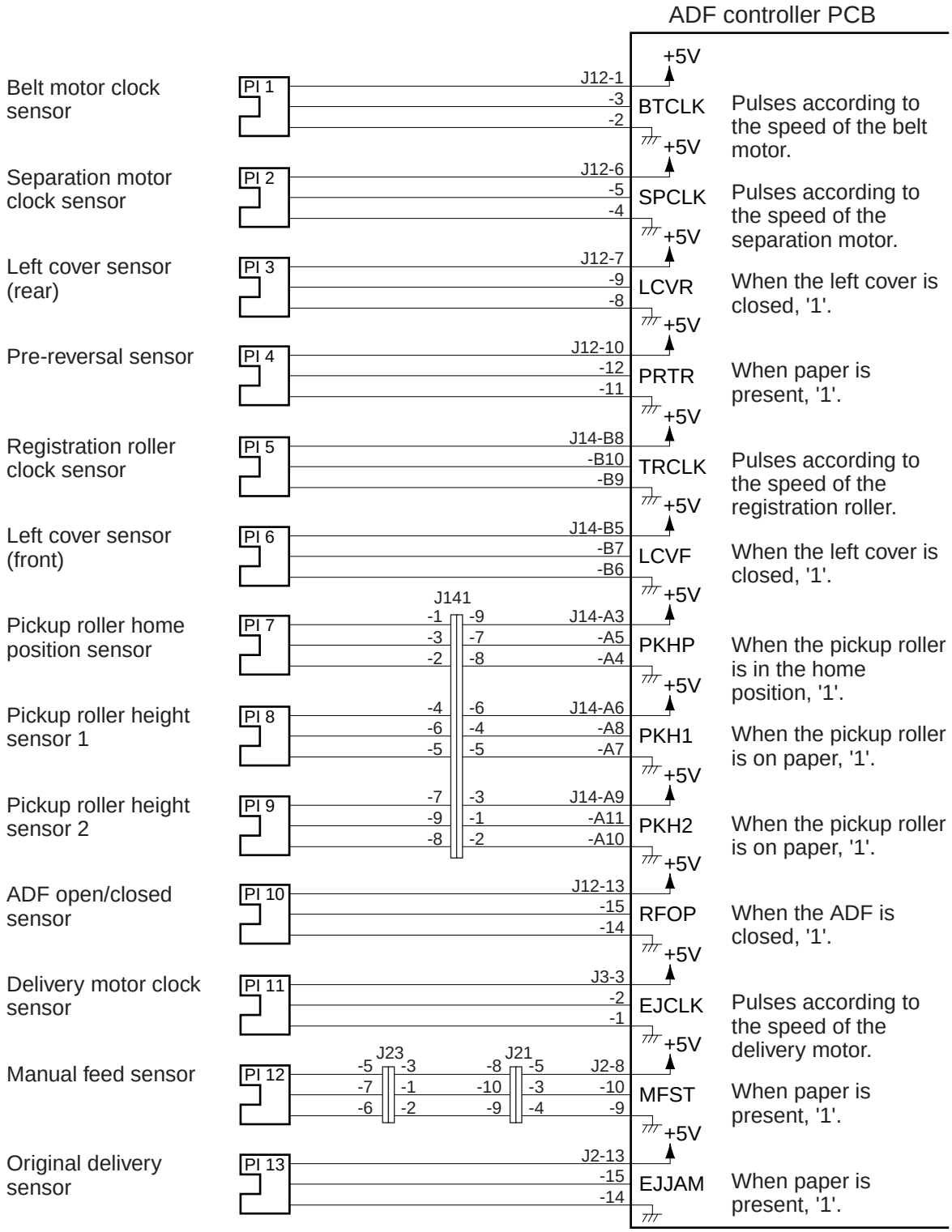

Figure 2-102

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Inputs to the ADF Controller PCB (2/2)

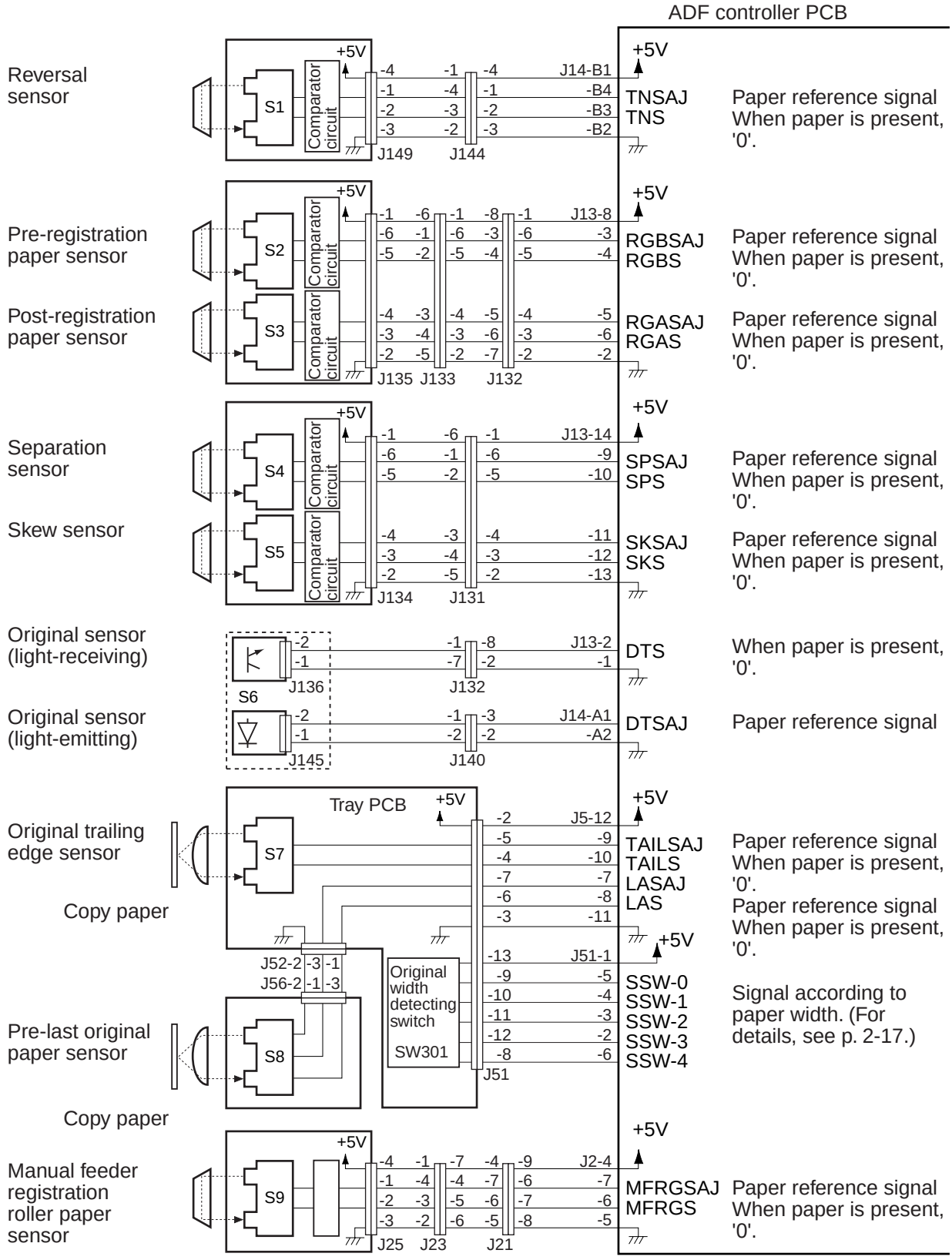

Figure 2-103

D. Outputs from the ADF Controller PCB

Outputs from the ADF Controller PCB (1/1)

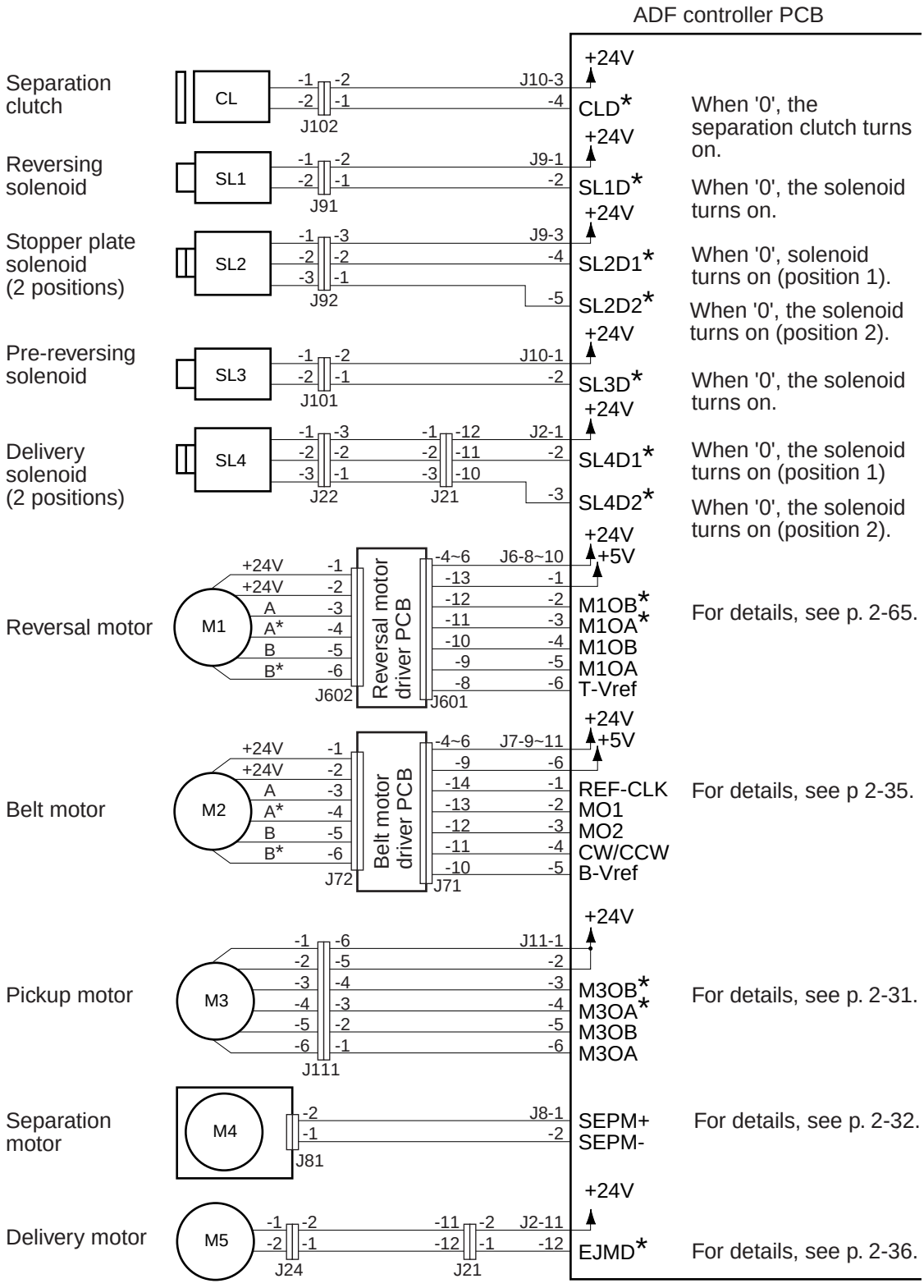

Figure 2-104

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II . BASIC OPERATIONS

A. Outline

The machine uses five motors and one clutch for picking up, separating, feeding, and delivering originals.

Name (notation)	Function
Reversal motor (M1)	Moves or reverses originals.
Belt motor (M2)	Moves originals.
Pickup motor (M3)	Moves up/down the pickup roller.
Separation motor (M4)	Separates originals.
Delivery motor (M5)	Delivers originals or picks up manually fed originals.
Separation clutch (CL)	Disengages or engages the pull-out roller and separation/feeding assembly drive system.

Table 2-201

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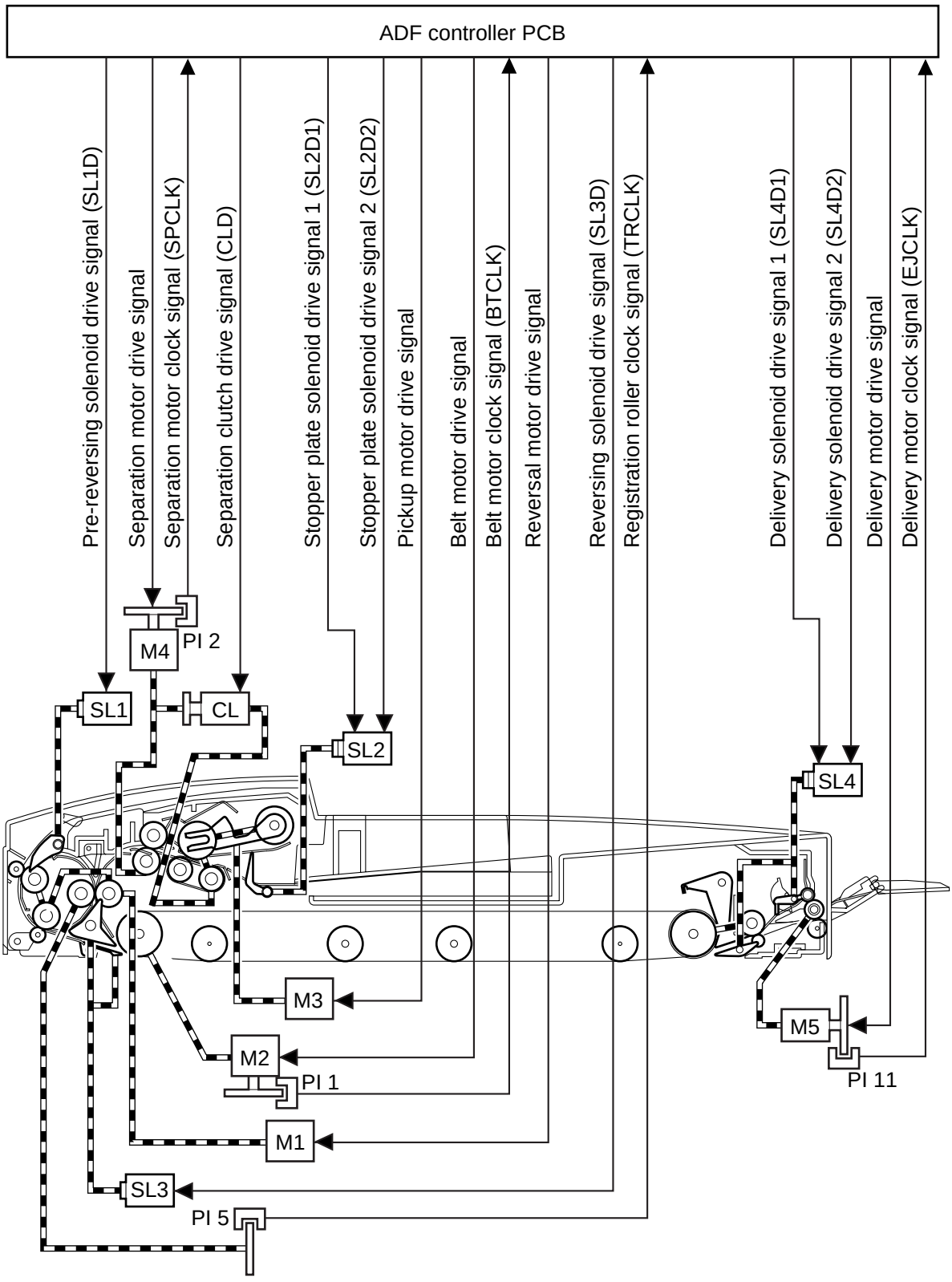

Figure 2-201 Drive Diagram

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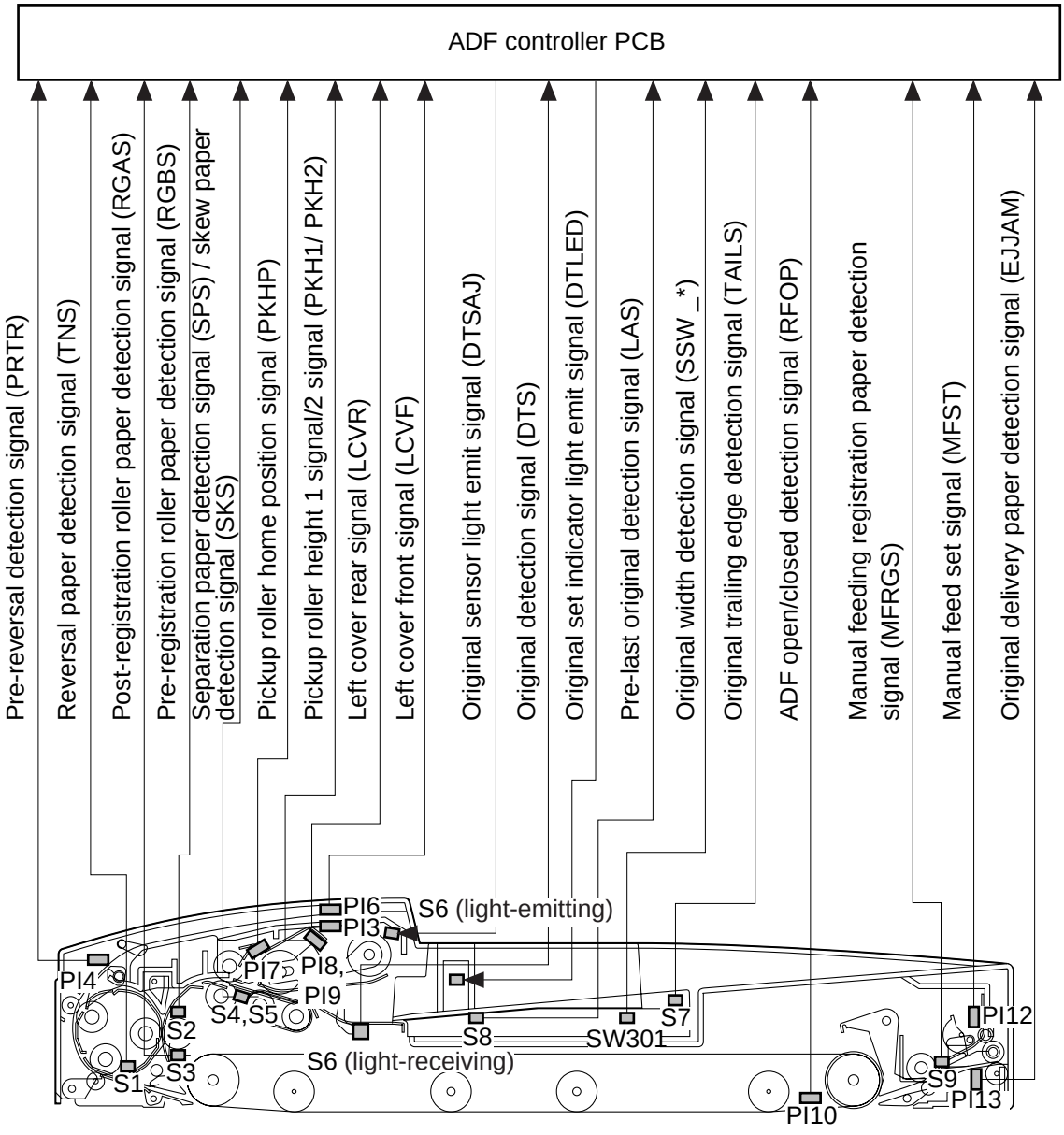

Figure 2-202 Sensor Arrangement

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B. Operations

1. Outline

The machine operates in either of three modes, executed in response to instructions from the copier for various copying operations. Table 2-202 shows these modes and explains the operations in each mode in relation to the mode's corresponding copying mode.

Operating mode	Outline	Corresponding copying mode	Copying operation
CW rotation/delivery	Picks up an original, and delivers it as it is after copying.	Single-sided original → single-sided copy Single-sided original → double-sided copy	Stream reading (fixed reading if ratio is not between 50% and 150%)
Pre-reversal pickup, reversal, delivery (small-size original)	Reverses and picks up an original, and reverses once again and delivers after copying.	Double-sided original → double-sided copy Double-sided original → single-sided copy	Fixed reading
Manual feeding feeder pickup/delivery	Picks up an original from the pickup assembly, and delivers it after copying.	Manual copying	Fixed reading

Table 2-202

2. CWW Pickup/Delivery

An original moves as follows:

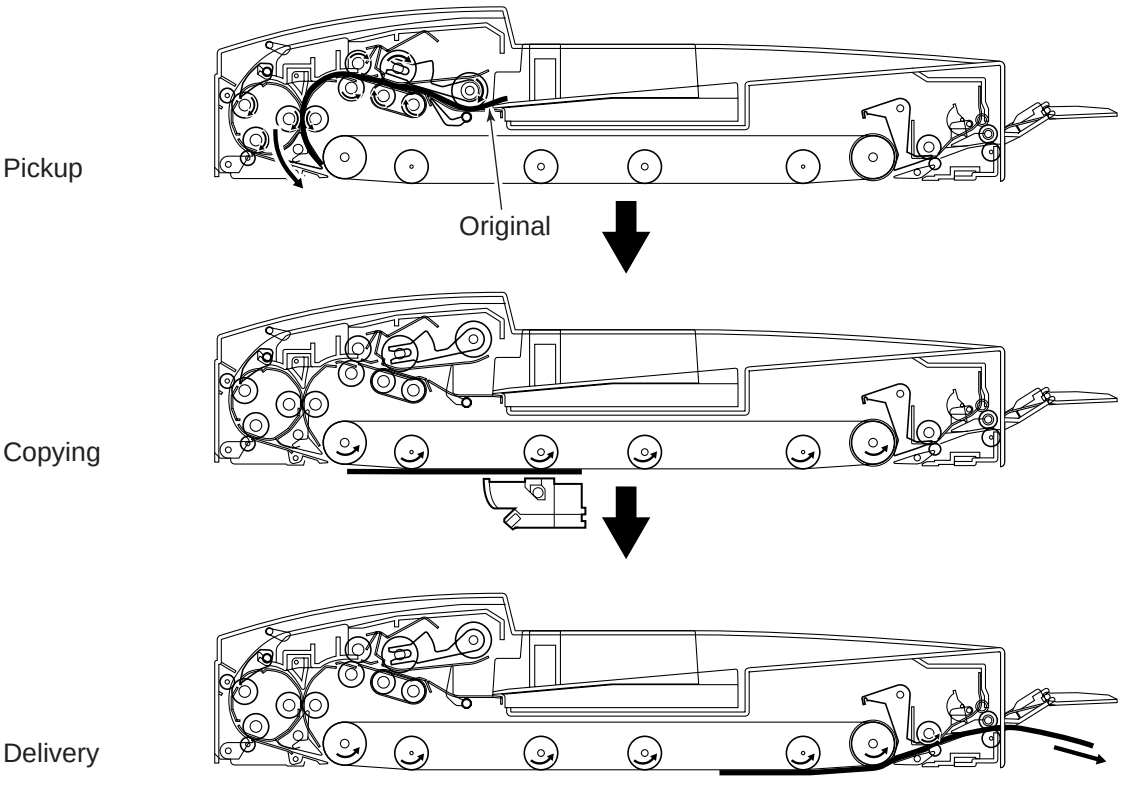

Figure 2-203

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3. Pre-Reversal Pickup, Reversal, Delivery (small-size original)

An original moves as follows:

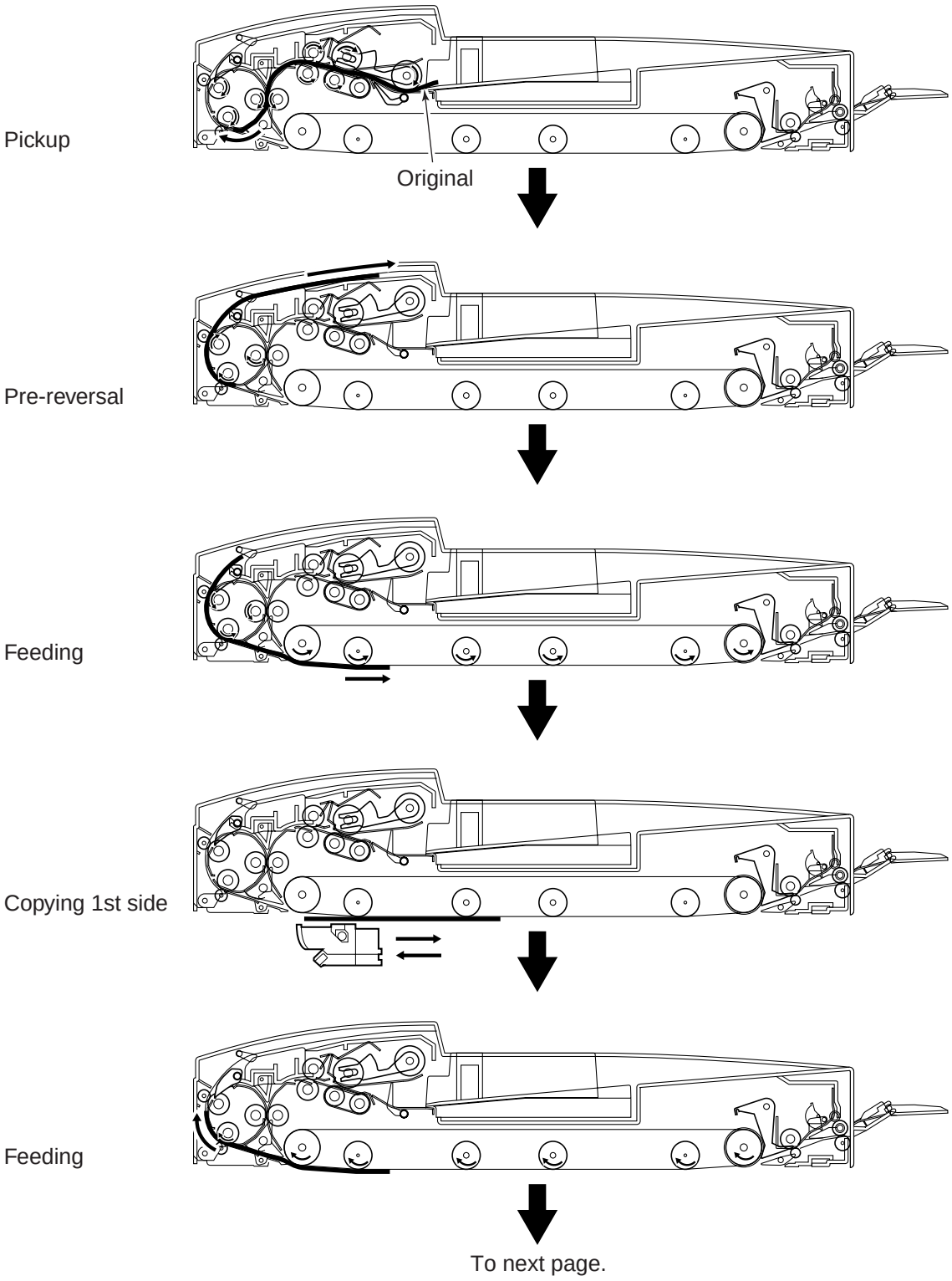

Figure 2-204-1

From previous page.

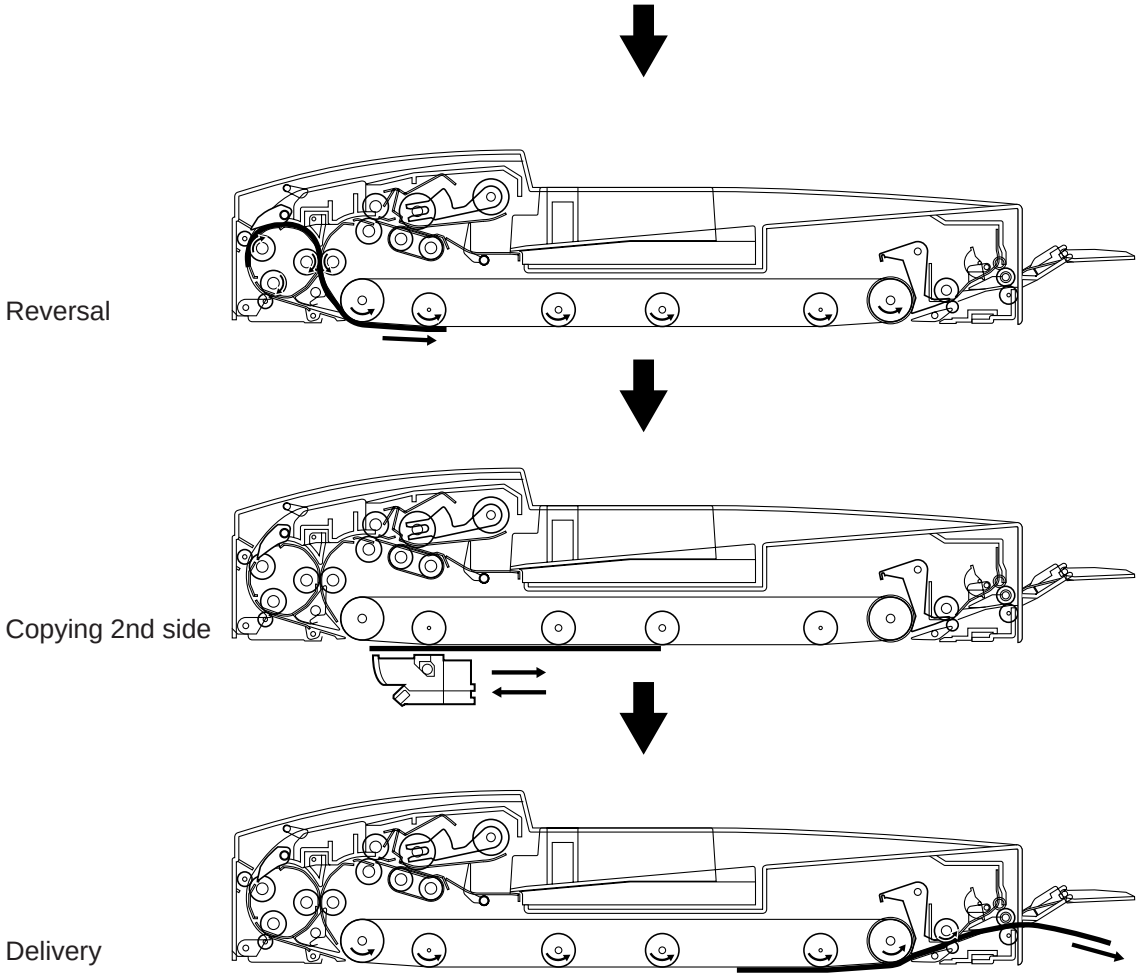

Figure 2-204-2

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4. Reversal Pickup, Reversal, Delivery (large-size original)

An original moves as follows:

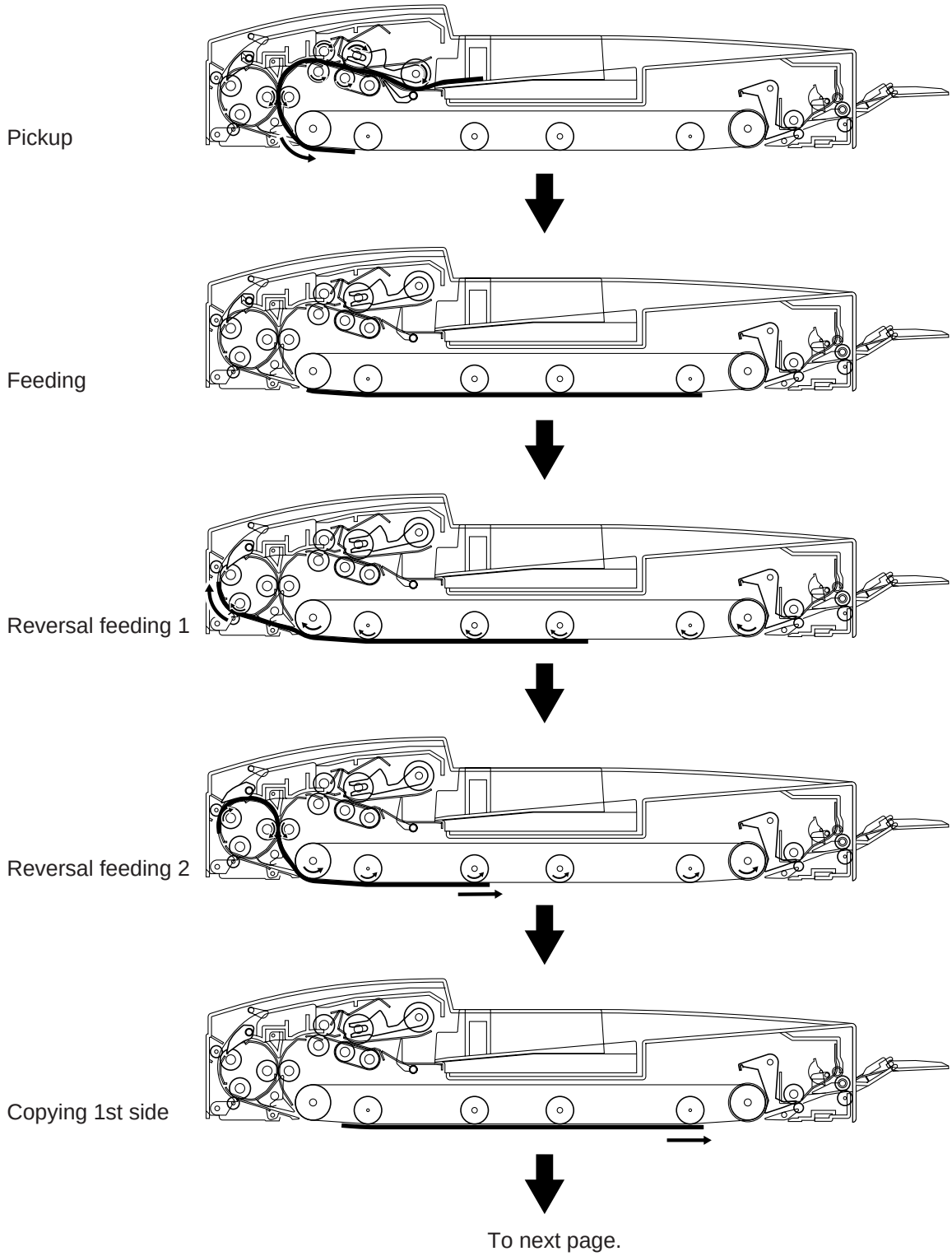

Figure 2-205

From previous page.

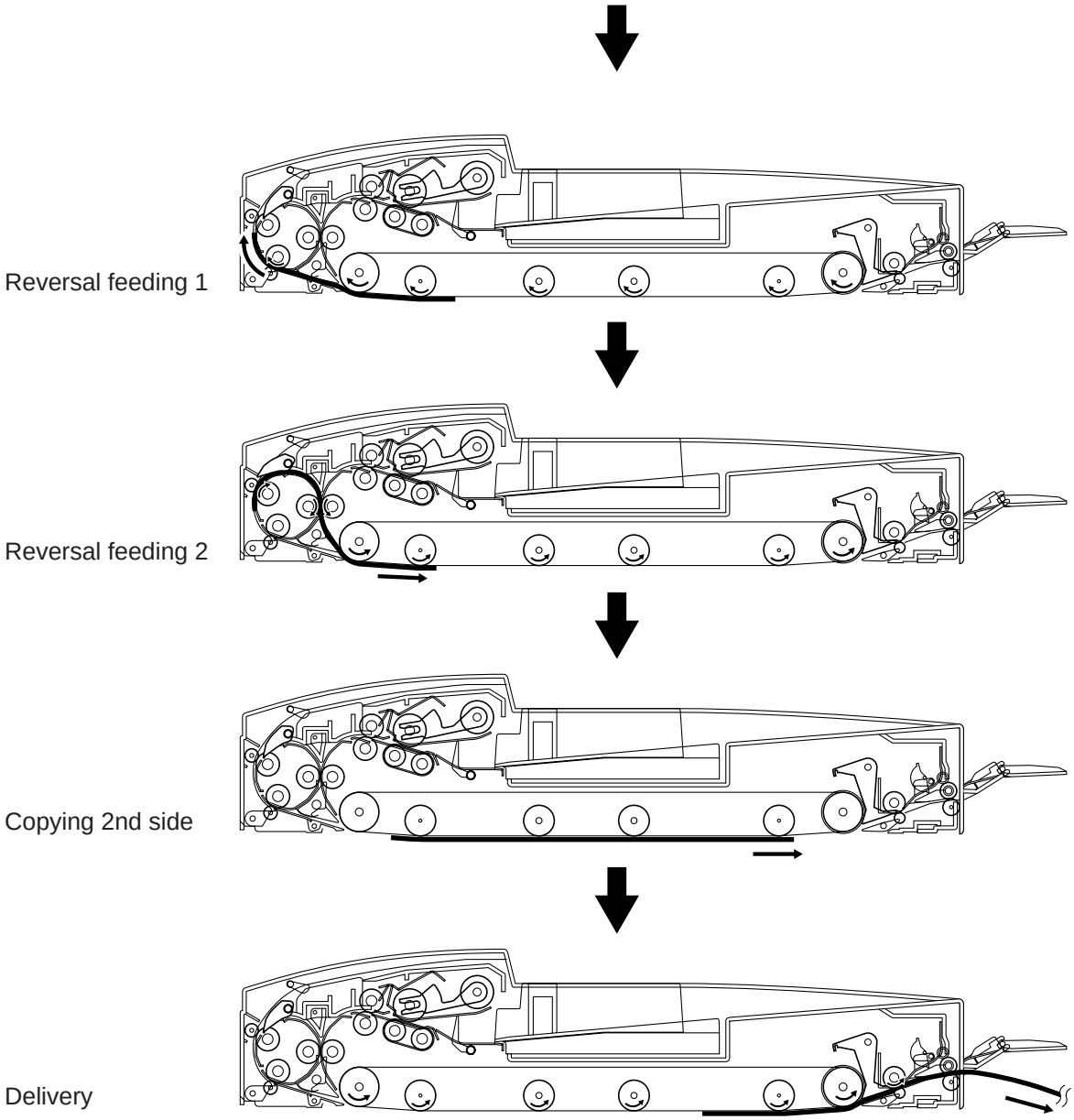

Figure 2-206

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5. Manual Feeder Pickup/Delivery

An original moves as follows:

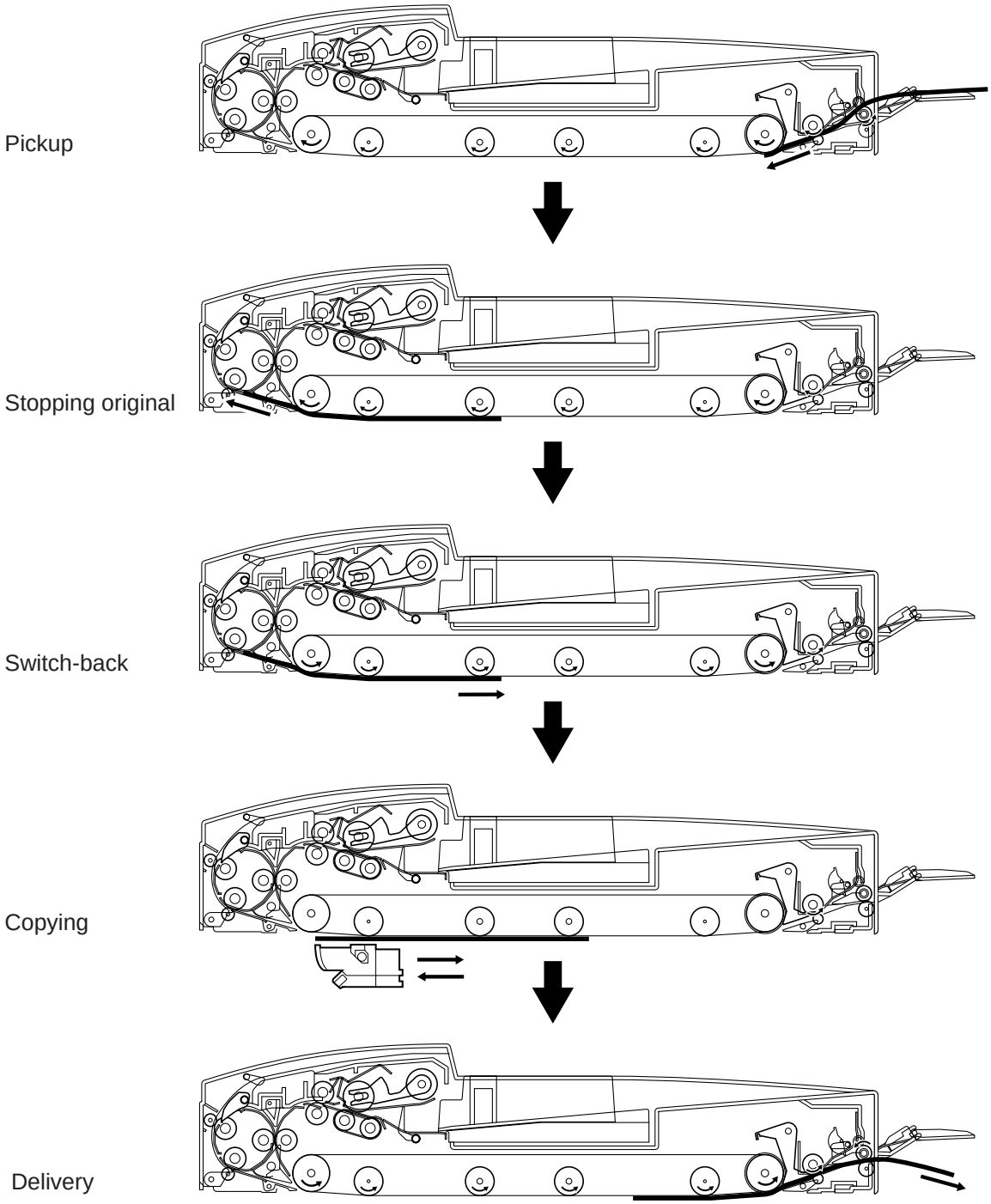

Figure 2-207

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C. Detecting an Original

1. Outline

The machine is equipped with the following five original detection mechanisms:

Function	Description	Sensor (notation)
Original detection	Detects the presence/absence of an original on the original tray.	Original sensor (S6)
Original size detection 1	Detects the size of an original set on the original tray (large- or small-size).	Original trailing edge sensor (S7)
Original size detection 2	Detects the size of an original being fed (default size).	Registration roller clock sensor (PI5) Original width detecting switch (SW301)
Pre-last original detection	Detects whether the original on the original tray is the last original or not.	Pre-last original sensor (S8)
Manual feeder original detection	Detects the presence/absence of an original in the manual feeder.	Manual feed sensor (PI12)

Table 2-203

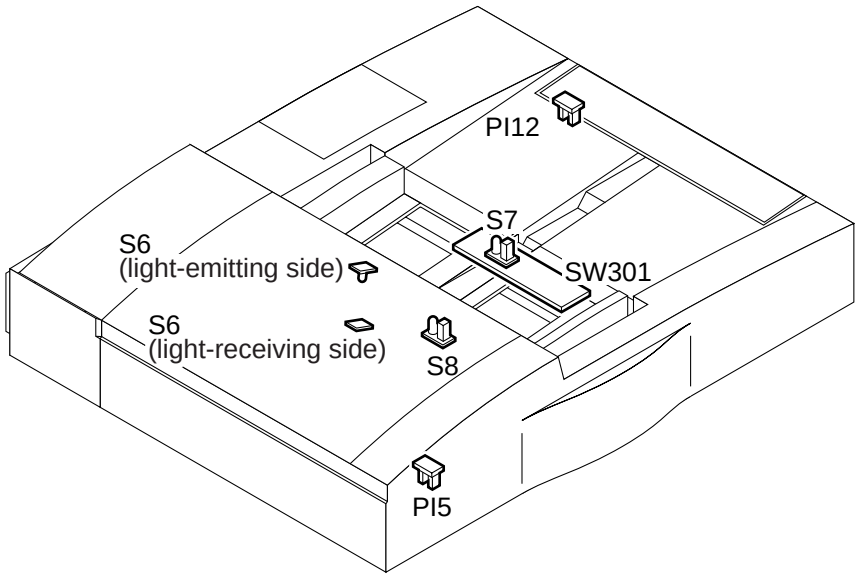

Figure 2-208

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2. Detecting the Presence/Absence of an Original

The presence/absence of an original on the original tray is detected by the original sensor (S6).

When an original is placed on the original tray, the light from the light-emitting side of the original sensor will be blocked, causing the light-receiving side of the sensor to send the original detection signal (DTS) to the ADF controller PCB. In response, the ADF controller PCB turns on the Original Set indicator.

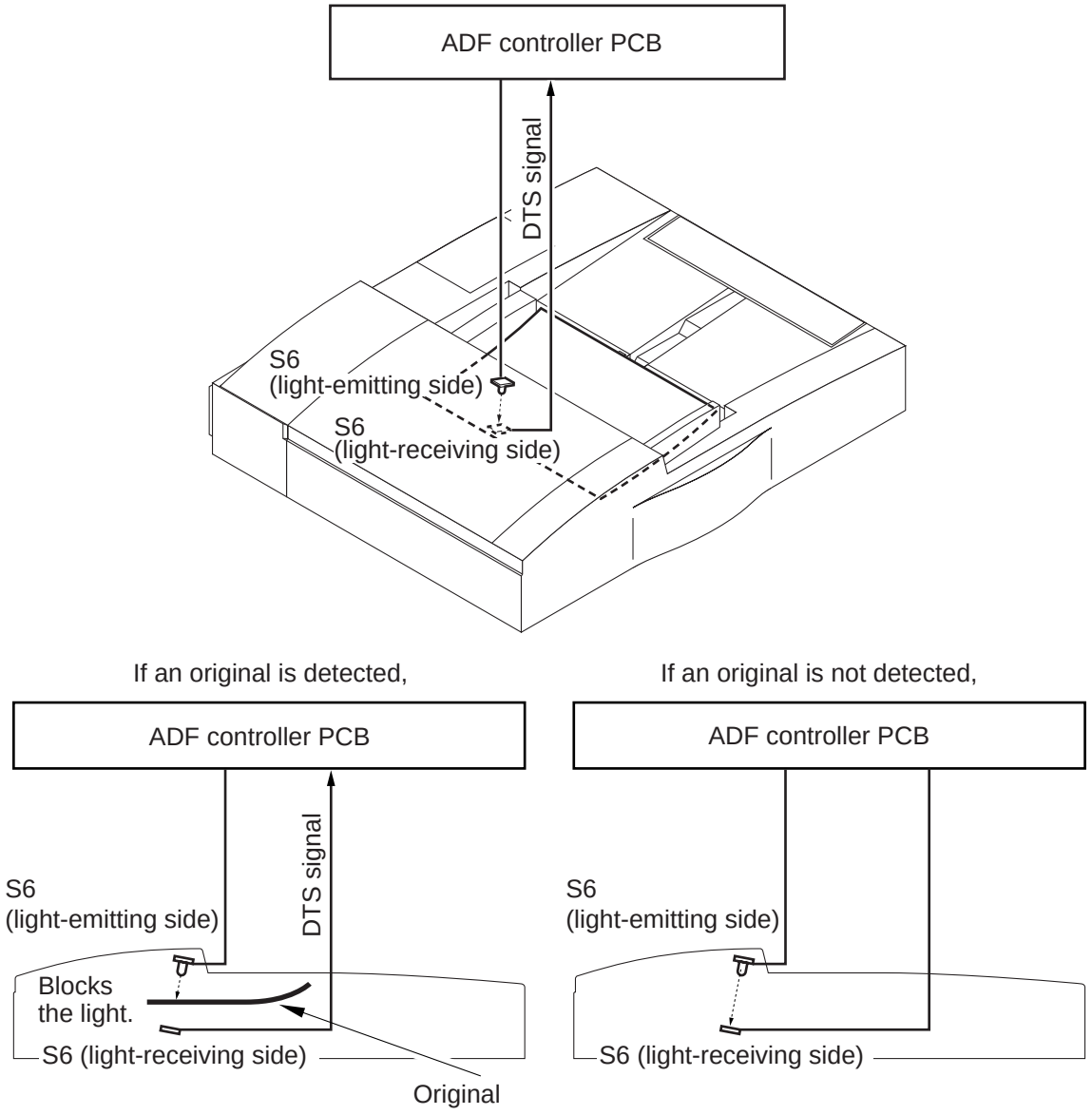

Figure 2-209

3. Original Size Detection 1

The function referred to as "original detection 1" relies on the original trailing edge sensor (S7).

The original trailing edge sensor serves to identify whether the original on the original tray is a small- or large-size original. When the original covers the original trailing edge sensor, the light from the LED of the original trailing edge sensor is reflected by the original to hit the photo transistor, causing the machine to assume that the original is a large-size original.

The machine then sends original size information (large- or small-size) to the copier, which in turn determines the stop position for the scanner in preparation for stream reading.

Small size	A5, A4, B5, STMT, LTR
Large size	A4R, B5R, A3, B4, LTRR, LGL, 279.4×431.8mm (11"×17")

Table 2-204

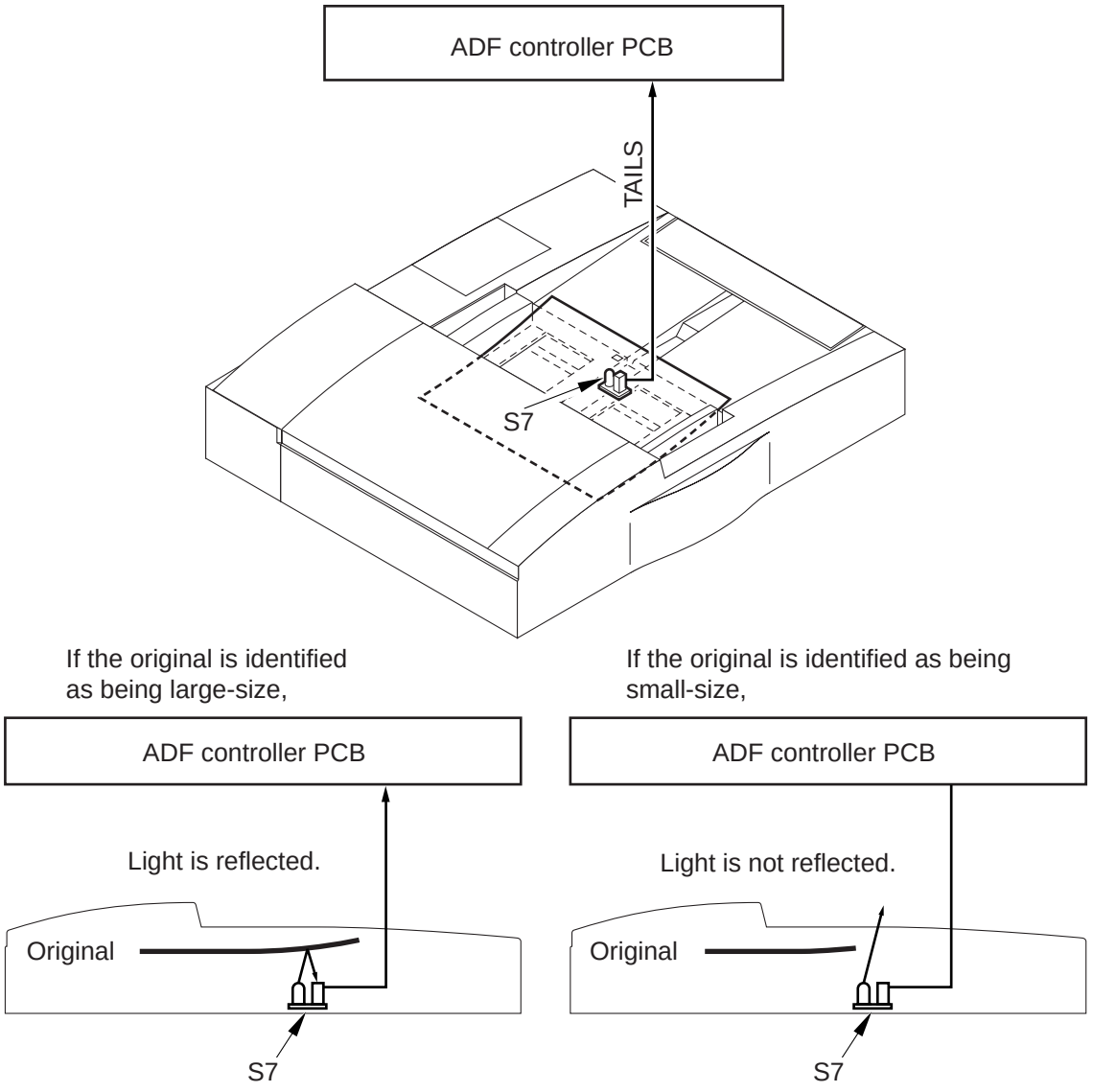

Figure 2-210

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4. Original Size Detection 2

a. Outline

The function referred to as "original detection 2" relies on the original width detecting switch (SW301) and the registration roller clock sensor (PI5), and is used to find out the size of an original in terms of several default sizes.

The original width detecting switch detects the "width of an original." As many as five contact plates (SSW0 through 4) operating in conjunction with the slide guide are in contact with the original width detecting switch, and information indicating the combination of states (ON or OFF) of the contact plates is sent to the ADF controller PCB, which will in response identify the width of the original. The table that follows show the state of each contact plate in relation to default sizes; combinations other than shown will be assumed to represent a non-default size.

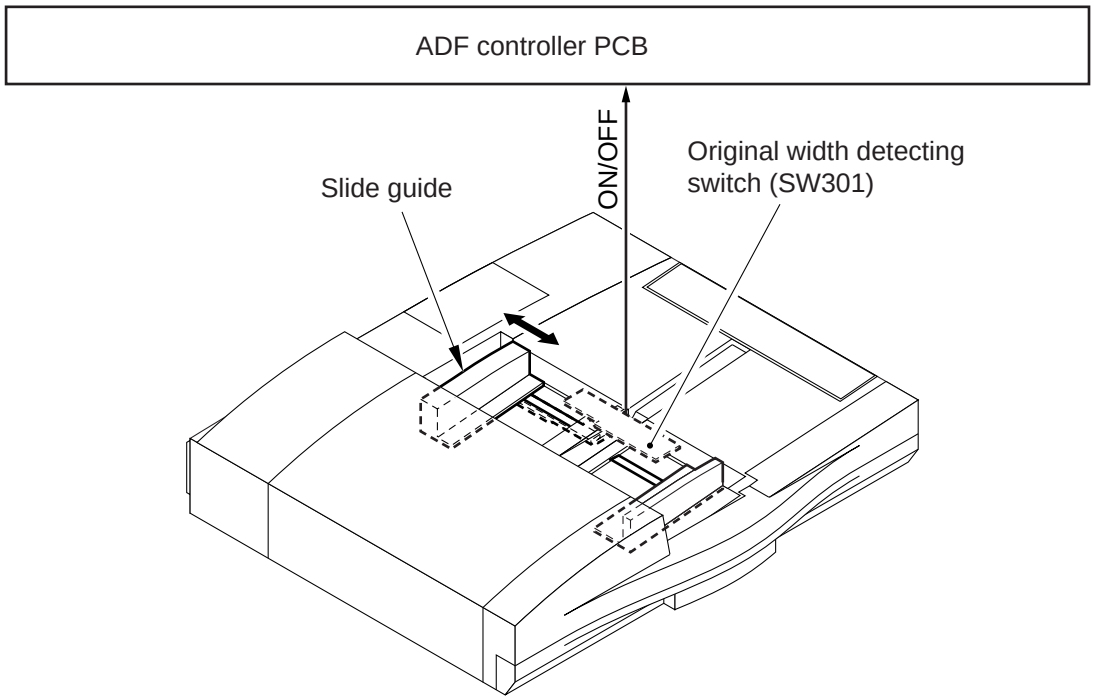

Figure 2-211a

Default size	SSW0	SSW1	SSW2	SSW3	SSW4
A5, A4R	ON ON	ON OFF	OFF OFF	ON ON	ON ON
A4, A3	ON ON	OFF OFF	OFF OFF	ON OFF	OFF OFF
B5R	ON	OFF	OFF	OFF	ON
B5, B4	ON ON	OFF OFF	ON ON	OFF OFF	ON OFF
STMT, LTRR, LGL	ON ON	ON ON	ON OFF	OFF OFF	ON ON
LTR, 279.4×431.8mm (11"×17")	ON ON	ON ON	OFF ON	OFF OFF	OFF OFF

Table 2-205 States of Switches

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The registration roller clock sensor (PI5) measures the "length of an original." The registration roller clock sensor counts the number of rotations made by the clock plate mounted to the slave roller of the registration roller.

The ADF controller PCB identifies the length of an original (in feeding direction) based on the number of rotations made by the clock plate.

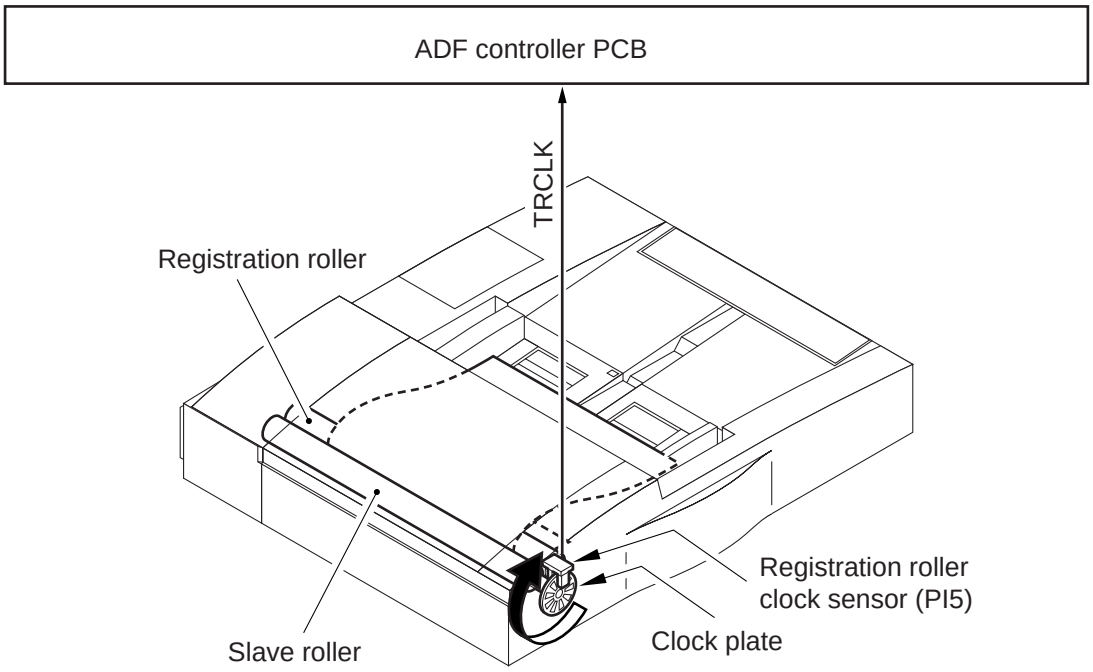

Figure 2-211b

The machine determines a default size based on the "width of the original" and the "length of the original" obtained by original detection 2, and sends the result to the copier, which uses the information when selecting copy paper.

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The machine identifies an original in terms of several default sizes based on the following:

A- and A/B-Configuration

Default size	Original length (mm)	Original width (mm)
B5R	237 to 297	180 to 184
A5	128 to 188	208 to 212
A4R	277 to 317	
FOOLSCAP	317 to 370	
B5	162 to 222	255 to 259
B4	344 to 404	
COMPUTER paper	361 to 421	277.4 to 281.4
A4	190 to 250	295 to 299
A3	400 to 460	

Any size not falling within the values will be identified as a non-default size.

Table 2-206

Inch-Configuration

Default size	Original length (mm)	Original width (mm)
STMT	120 to 180	213.9 to 217.9
LTRR	259 to 309	
FOOLSCAP	310 to 343	
LGL	343 to 396	
LTR	196 to 256	
COMPUTER paper	361 to 411	
279.4×431.8mm (11"×17")	412 to 472	277.4 to 281.4

Any size not falling within the values will be identified as a non-default size.

Table 2-207

Inch/A-configuration, Inch/AB-configuration

Default size	Original length (mm)	Original width (mm)
B5R	237 to 297	180 to 184
A5	128 to 188	208 to 212
A4R	277 to 337	
STMT	120 to 180	213.9 to 217.9
LTRR	259 to 309	
FOOLSCAP	310 to 343	
LGL	343 to 396	
B5	162 to 222	255 to 259
B4	344 to 404	
LTR	196 to 256	277.4 to 281.4
COMPUTER paper	361 to 411	
279.4×431.8mm (11"×17")	412 to 472	
A4	190 to 250	295 to 299
A3	400 to 460	

Any size not falling within the values will be identified as a non-default size.

Table 2-208

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b. Slide Guide Lock

The machine is equipped with a lock to prevent the slide guide lock from spreading wider than A4/A3 paper (297 mm).

To use an original wider than 297 mm, the slide guide lock must be removed. (Without the lock, originals may be as wide as 305 mm, but their length in feeding direction must be 432 mm or less.)

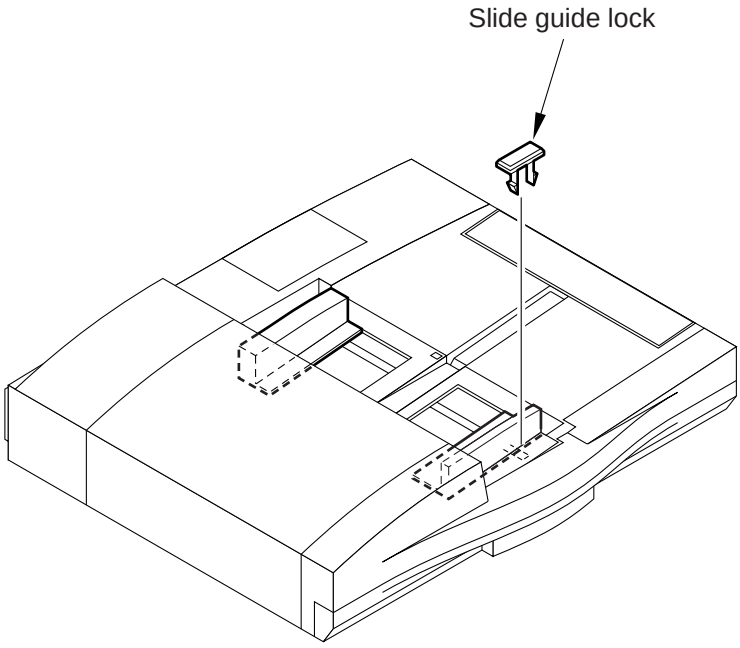

Figure 2-212

Caution:

The slide guide must always be adjusted to the original size during copying; otherwise, the originals may move askew.

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c. Slide Guide Positioning Rolls

The rails of the slide guide are provided with grooves so that the guide may stop at appropriate default size positions. Some paper sizes, however, could stop the slide at incorrect positions (because of the limited distance between stop positions). To avoid such a problem, the machine uses two slide guide positioning rolls, allowing the stop positions of the slide guide to be changed by relocating the rolls.

Color of positioning roll	Stop position of slide guide	
	Face with 1 groove	Face with 1 groove
Gray (for A/B-configuration)	A4R	A4R LTRR
Black (for Inch-configuration)	LTRR	LTRR A4R

Table 2-209

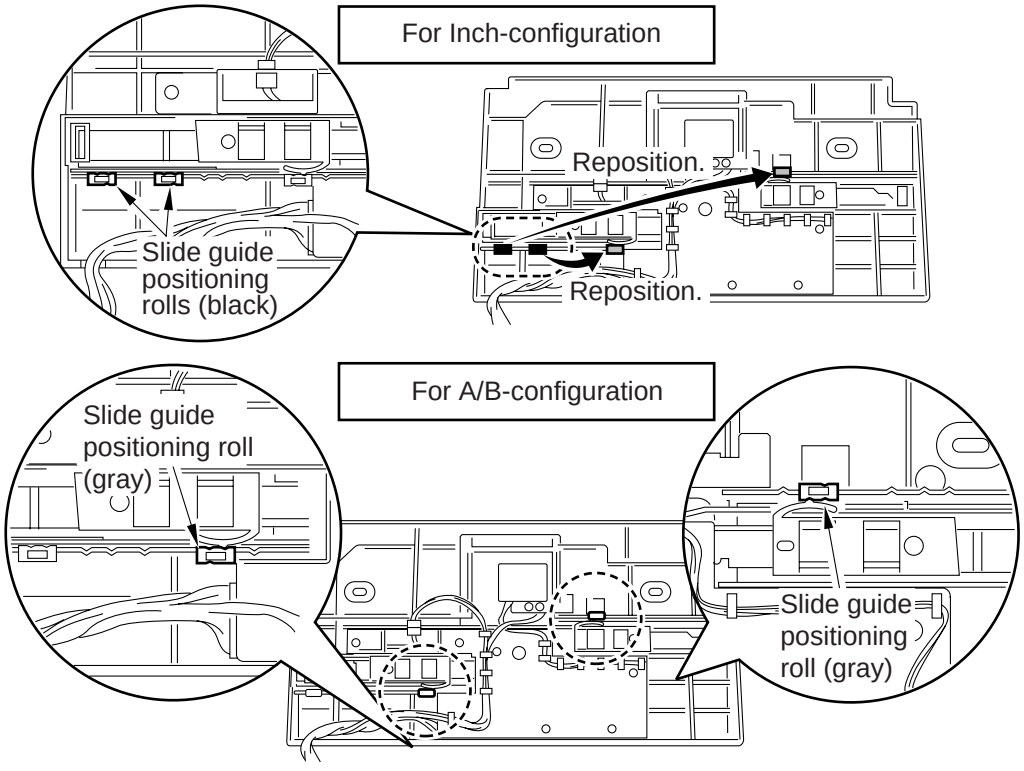

Figure 2-213

5. Pre-Last Original Detection

The function referred to as "pre-last original detection" relies on the pre-last original sensor (S8).

The mechanism operates only when small-size originals are used. The machine picks up the first original (small-size), and then sends the second original from the original tray to the separation assembly. At this time, if no original covers the pre-last original sensor (S8), the machine will identify the condition as indicating the absence of an original and communicates the fact to the copier.

Small size	A5, A4, B5, STMT, LTR
Large size	A4R, B5R, A3, B4, LTRR, LGL, 279.4×431.8mm (11"×17")

Table 2-210

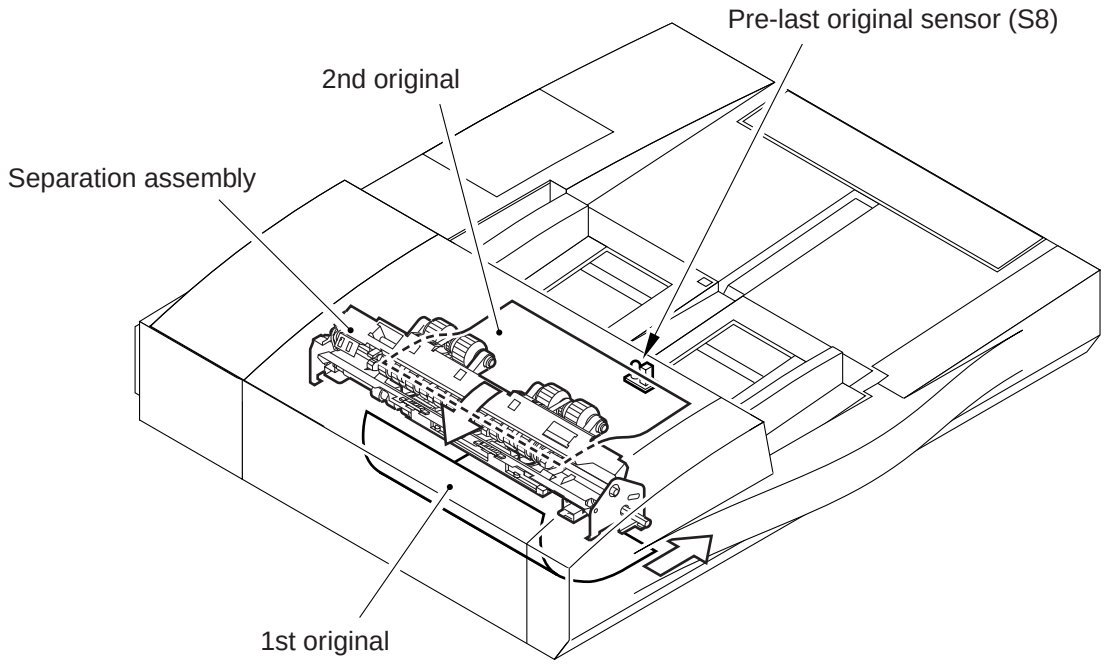

Figure 2-214

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6. Detecting the Presence/Absence of an Original in the Manual Feed Assembly

The presence/absence of an original in the manual feed assembly is detected by the manual feed sensor (PI12).

When an original is set in the manual feed assembly, the original presses the sensor flag, causing it to cover the sensor and ultimately causing the machine to assume the presence of an original in the manual feeder.

When the manual feeder sensor detects an original, the machine will automatically start to pick up the originals in about 0.3 sec for the copier to start copying operation.

Note:

The auto pickup function may be disabled using the copier's user mode (feeder manual feed auto start). Once this function is disabled, operation must be started by pressing the copier's Copy Start key.

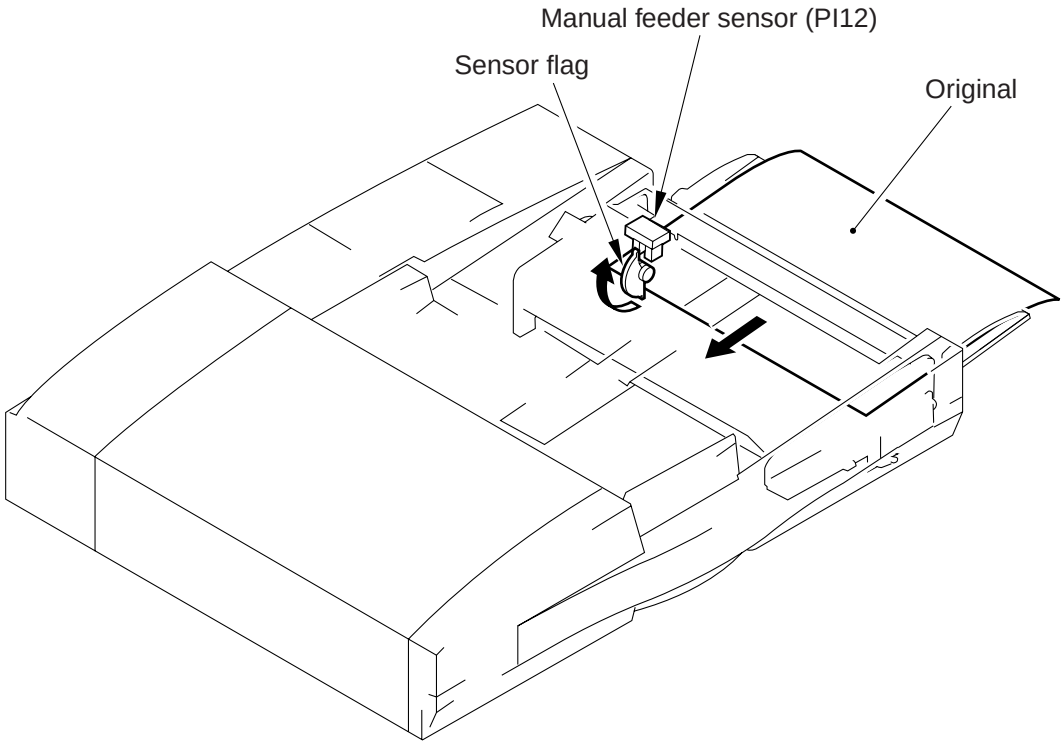

Figure 2-215

D. Original Pickup/Separation

1. Outline

The machine picks up an original by rotating the pickup roller while butting the pickup roller unit against the original surface. The pickup roller unit is moved up/down by the pickup motor (M3). The pickup roller is driven by the separation motor (M4) and the separation clutch (CL).

Originals are separated by the separation roller and the separation belt and the feeding roller. Each roller and the belt are driven in turns by the separation motor (M4) and the separation clutch (CL).

The separation assembly is equipped with a separation sensor (S4) and a skew sensor (S5) to monitor the movement of originals.

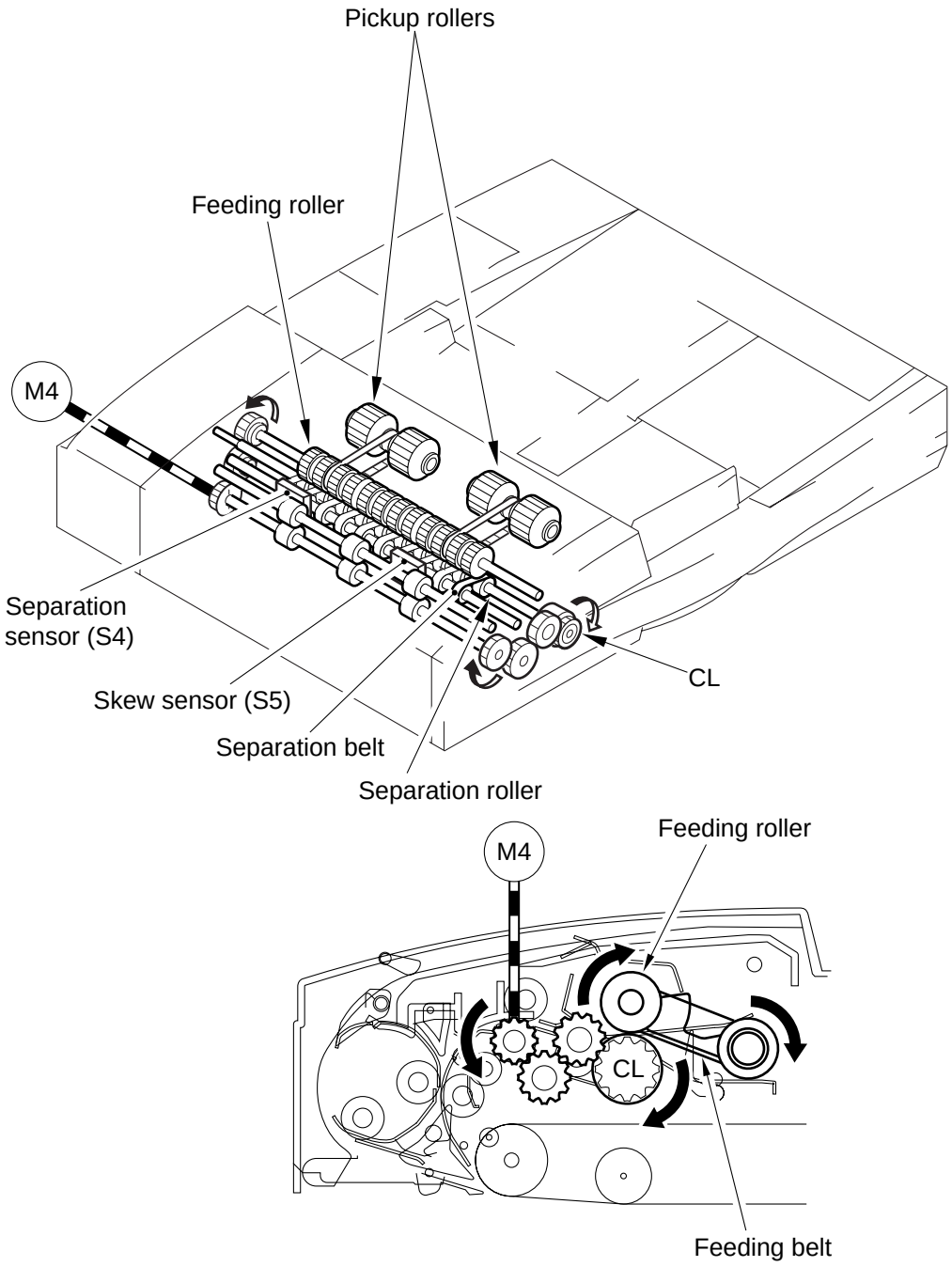

Figure 2-216

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2. Moving Up/Down the Pickup Roller Units

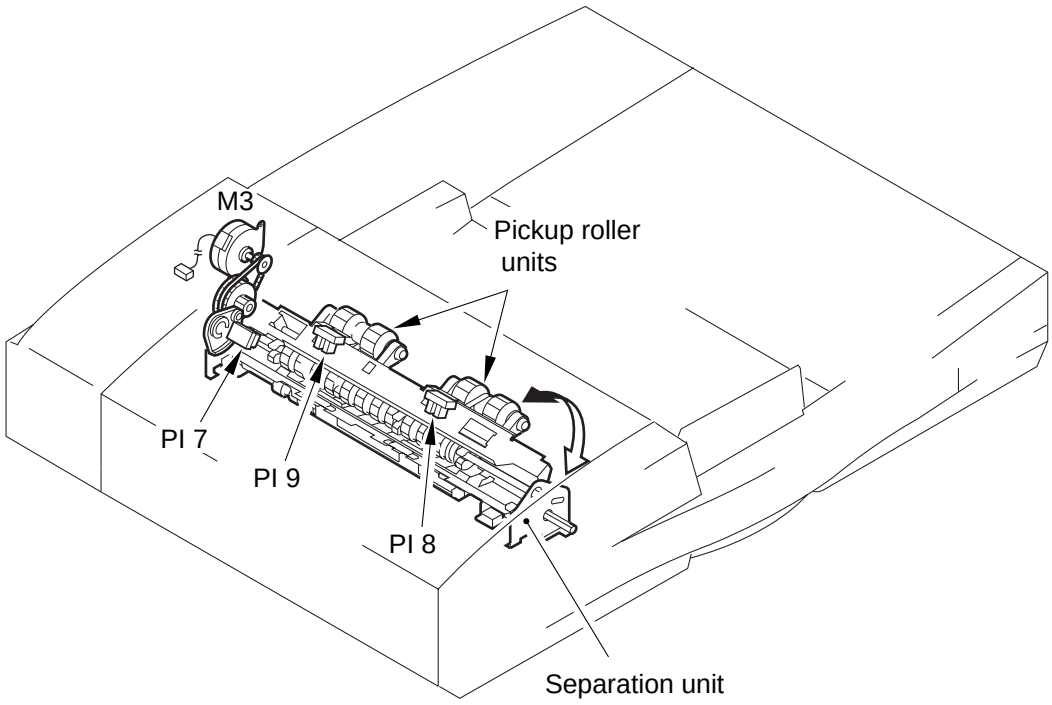
a. Outline

The machine possesses two pick-up roller units, each moving up between its home position and the top of an original stack for pickup operation. The pickup roller units are moved up and down by the pickup motor (M3).

The pickup roller stops at either of the following three points, as determined by the output of its respective sensor or by combinations of sensor outputs and pulses from the pickup motor.

Stop position	Operation	Sensor (notation)
Home position	Waits until the next copying run.	Pickup roller home position sensor (PI7)
Wait position	Waits until the next pickup operation.	Pickup height sensor 1/2 (PI8/9) Pickup motor (M3) pulse output
Pickup position	Picks up an original.	Pickup height sensor 1/2 (PI8/9) Pickup motor (M3) pulse output

Table 2-211



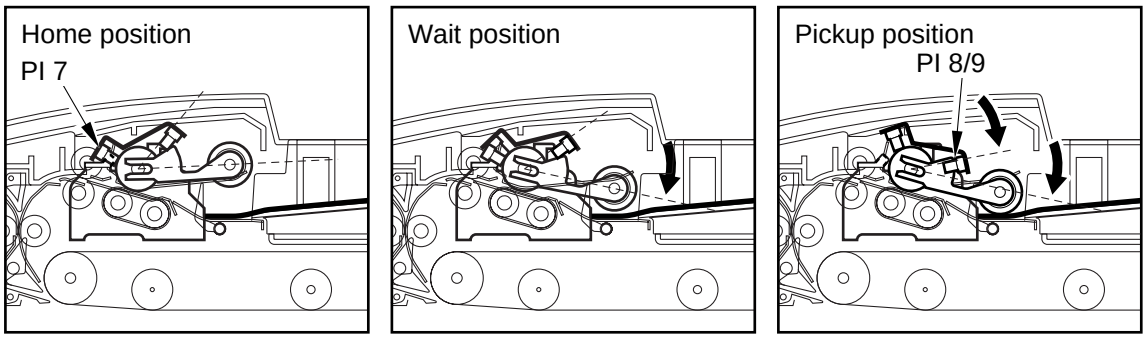


Figure 2-217

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b. Operation

When the copier's Copy Start key is pressed, the machine's stopper plate moves down and the pickup motor (M3) starts to rotate, causing the pickup roller to move down to the stack of originals.

The pickup motor stops when the pickup roller unit reaches a point about 1 mm below the pickup height sensor 1 (PI8) and the pickup height sensor 2 (PI9).

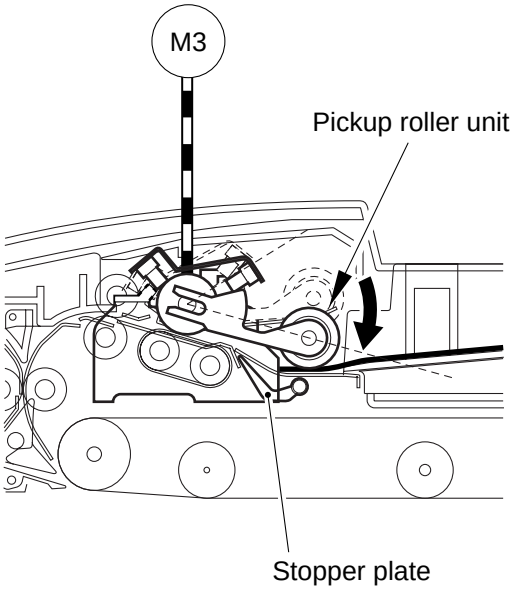

Figure 2-218

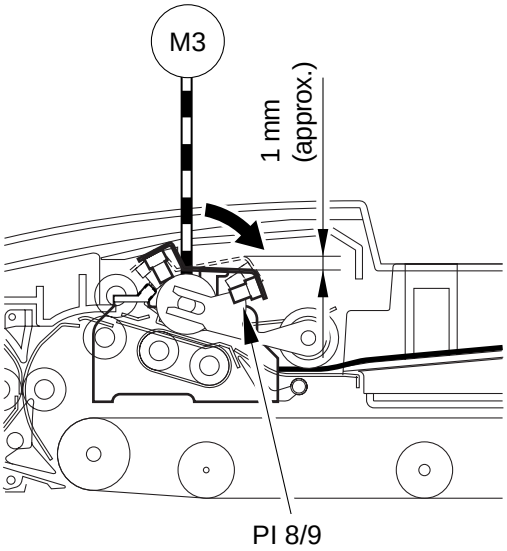

Figure 2-219

When the pickup roller unit stops to move down, the separation clutch (CL) and the separation motor (M3) start to operate, thereby moving the first original to the separation assembly.

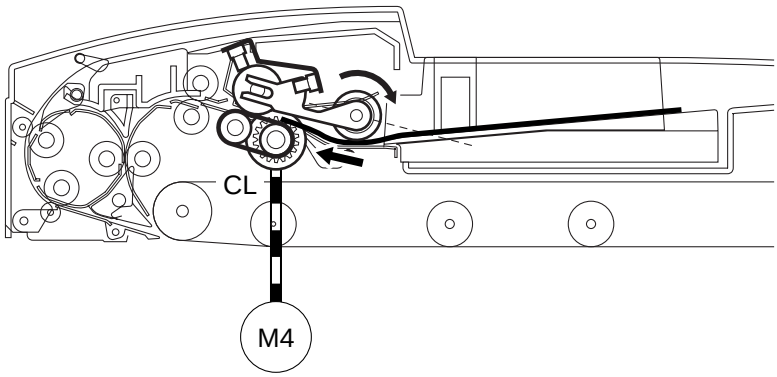

Figure 2-220

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When the leading edge of the first original reaches the separation sensor (S4), the pickup motor (M3) starts to rotate, moving the pickup roller unit away from the stack of originals. The pickup roller unit stops at the escape position, which is about 1 mm from the stack of originals.

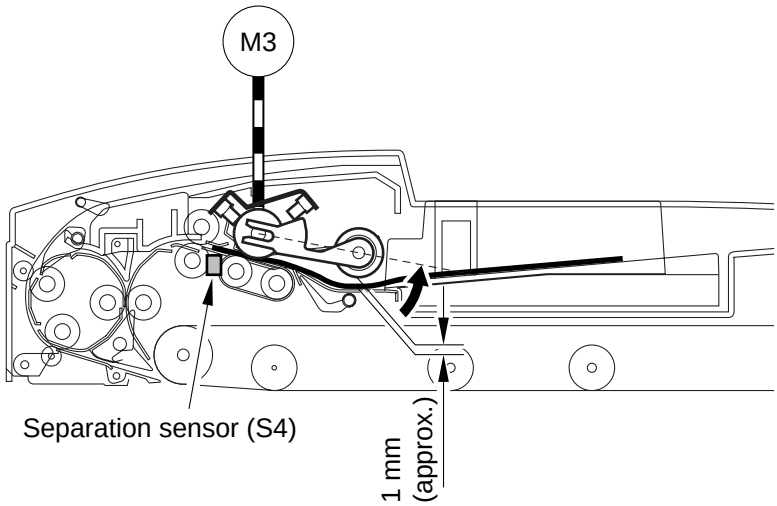

Figure 2-221

As soon as the first original leaves the separation assembly, the pickup roller unit moves down to the stack of originals once again to pick up the second original.

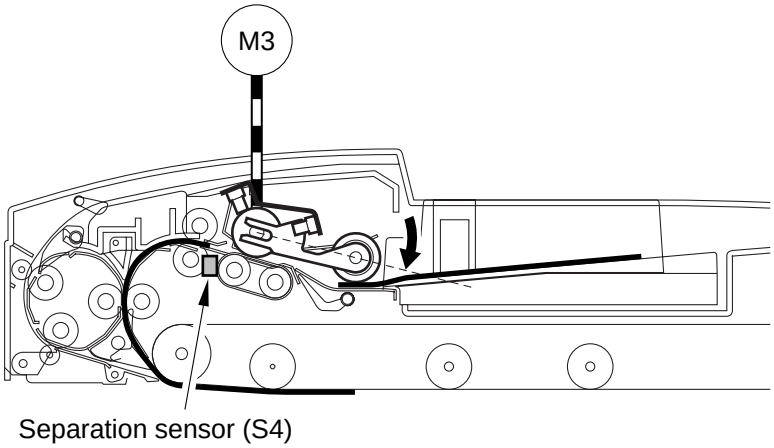

Figure 2-222

3. Switching the Separation Pressure

The machine's separation assembly is equipped with a separation pressure switching mechanism, changing the pressure between "low" and "high."

The pressure may be switched by operating the separation pressure lever located in front of the separation assembly. When the lever is operated, the position of the separation belt moves up or down to change the overlap with the feeding roller, thereby switching the pressure.

Note:

At time of shipment from the factory, the separation switching lever is set to "low."

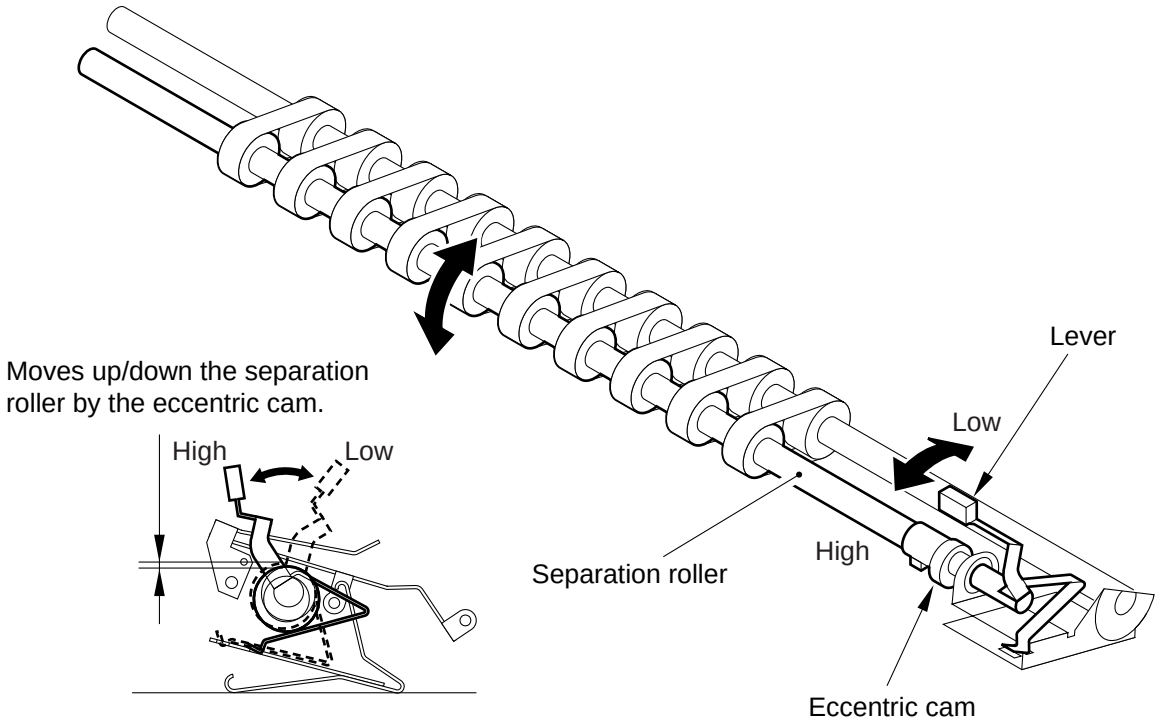

Figure 2-223

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4. Separation Sensor (S4), Skew Sensor (S5)

The separation sensor (S4) and the skew sensor (S5) located in the original path are used to monitor the movement of originals for the following:

Check on	Sensor (notation)	Alarm
Separation fault (delay)	Separation sensor (S4)	0031
Original skew	Separation sensor (S4) Skew sensor (S5)	0011

Table 2-212

If the separation sensor does not detect an original a specific period of time after the separation motor starts to rotate, the machine will identify the condition as being a separation error (delay).

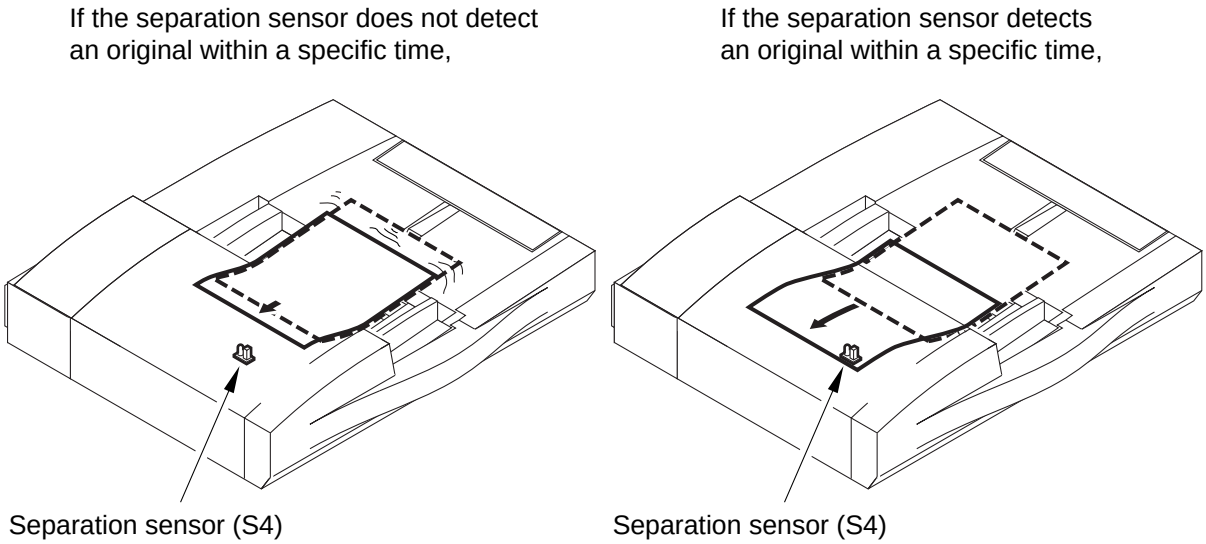
If the separation sensor does not detect an original within a specific time,
If the separation sensor detects an original within a specific time,
Separation sensor (S4)
Separation sensor (S4)

Figure 2-224

Both separation sensor and skew sensor are used to check for skew movement. The two sensors are arranged in a row in front-to-rear direction, and the machine checks for skew movement based on a discrepancy occurring when an original moves past these two sensors. The machine will identify a skew movement when the discrepancy is 10 mm or more, stopping its operation to protect the original and causing the copier to indicate the Jam message.

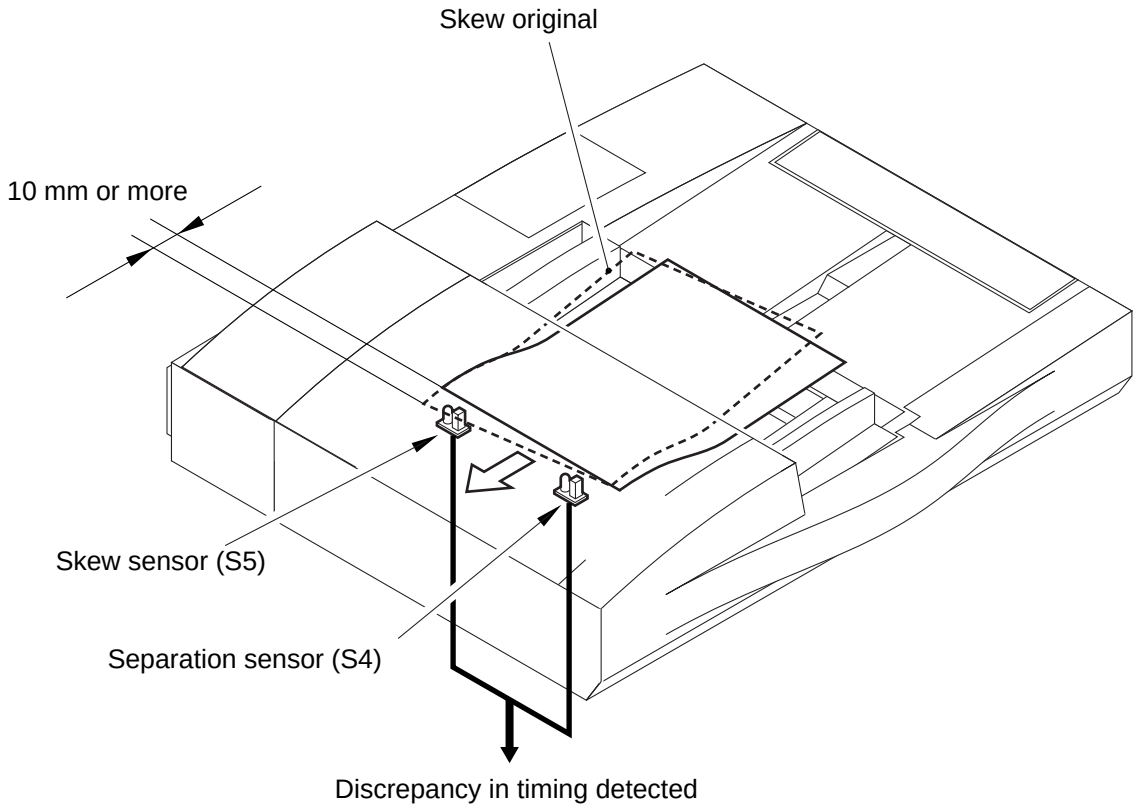

Figure 2-225

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5. Controlling the Pickup Motor (M3)

Figure 2-226 shows the circuit used to control the pickup motor (M3). The pickup motor is a 4-phase stepping motor, and the circuit has the following functions:

- Turning on and off the motor
- Controlling the direction of motor rotation
- Keeping the motor at rest

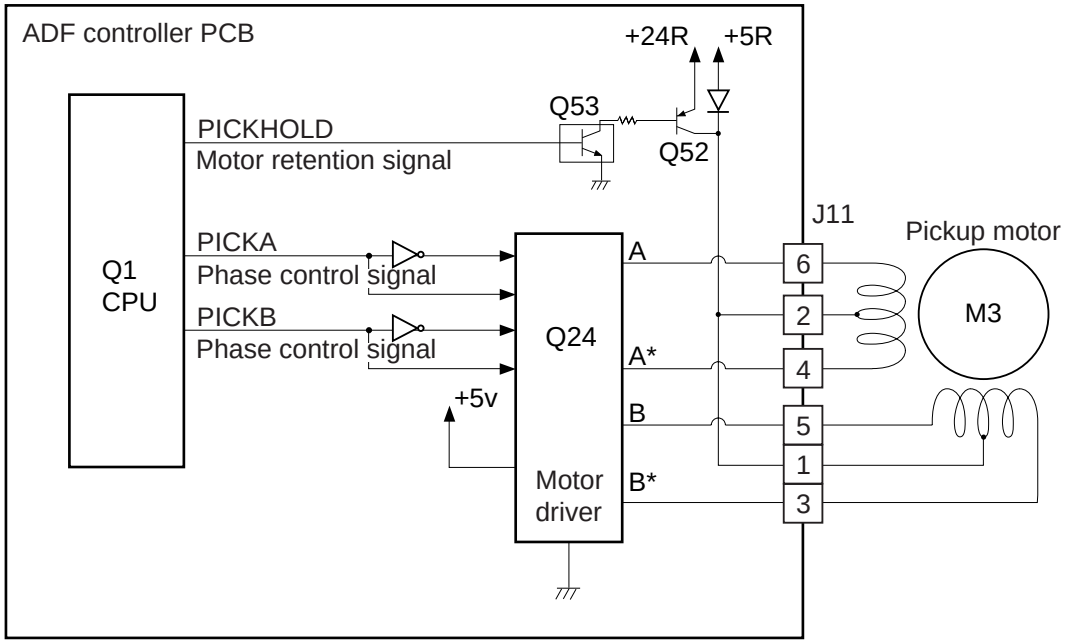

Figure 2-226

The CPU (Q1) on the ADF controller PCB causes the motor retention signal (PICKHOLD) to go '0', and applies +24 R to the pickup motor for drive. At the same time, the CPU sends the phase control signal (PICKA, PICKB) to the motor driver (Q24). In response, the motor driver controls the output timing of the pulse signals to suit the phase control signal, thereby switching the rotation of direction of the pickup motor.

In the absence of the phase control signal (PICKA, PICKB) from the CPU, the motor retention signal goes '1', applying +5 R to the pickup motor for retention, thereby holding the motor shaft from rotating.

Related Error Code

E410	• Error in the pickup motor (M3) • Error in the pickup roller height sensor (PI8) • Error in the pickup roller height sensor (PI9) • Error in the pickup roller home position sensor (PI7) • Error in the ADF controller PCB

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6. Controlling the Separation Motor (M4)

Figure 2-227 shows the circuit used to control the separation motor (M4). The separation motor is a DC motor, and the circuit has the following functions:

- Turning on and off the motor
- Controlling the motor speed
- Protecting the motor from over current

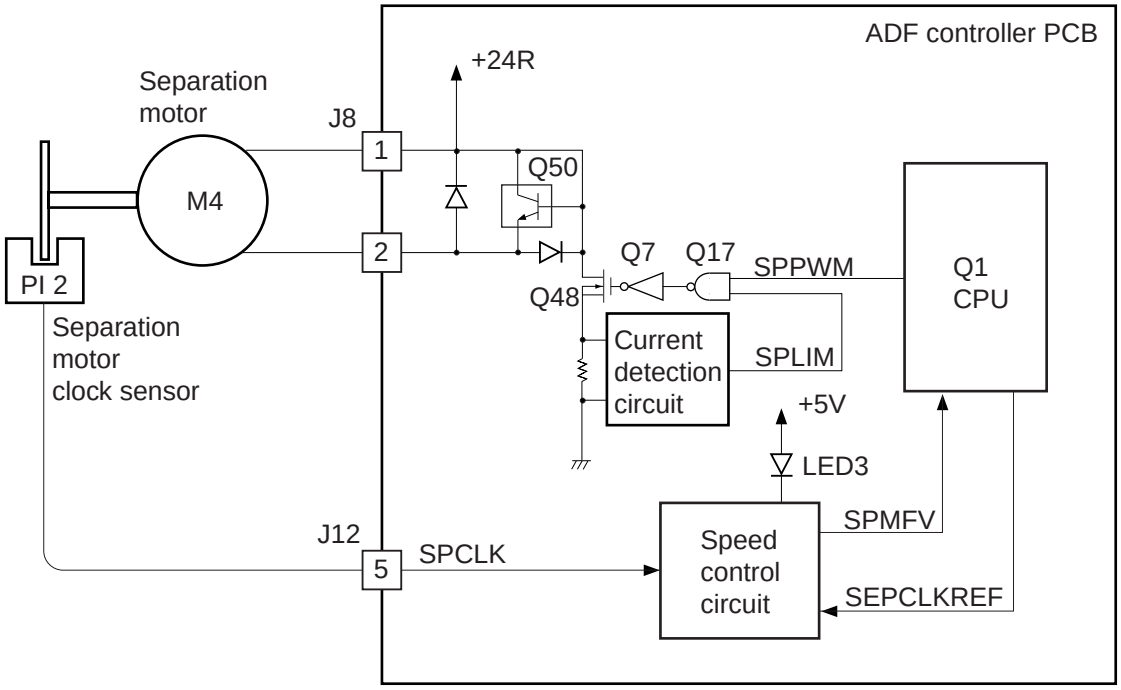

Figure 2-227

When the CPU generates the motor rotation speed signal (SPPWM), the separation motor (M4) starts to rotate in a specific direction. The separation motor clock sensor (PI2) sends the separation motor rotation speed signal (SPCLK) to the speed control circuit. In response, the speed control circuit compares the rotation speed signal and the speed reference signal (SEPCLKREF) from the CPU, and sends the speed control signal (SPMFV) to the CPU.

The CPU varies the rotation speed signal based on the speed control signal it receives. LED3 turns on as long as the rotation speed of the motor remains within a specific range, and turns off when it is otherwise.

The current detection circuit monitors the current flowing into the separation motor at all times, and will generate the separation motor stop signal (SPLIM) to stop the motor when the current exceeds a specific level.

If the separation motor stop signal is generated continuously, the CPU will identify the condition as an error in the separation motor, causing the copier to indicate an error code (E405).

Related Error Code

E405	• Error in the separation motor (M4) • Error in the separation motor clock sensor (PI2) • Error in the ADF controller PCB

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7. Sequence of Operations

Original Pickup/Separation

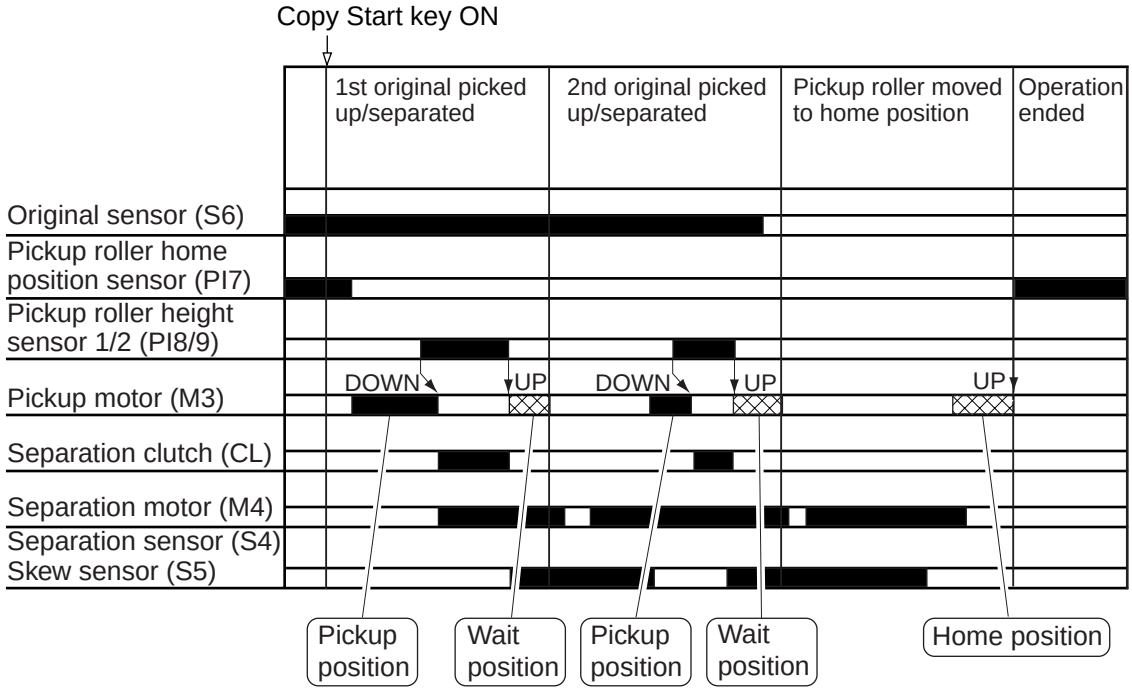

Figure 2-228

E. Feeding/Delivering Originals

1. Outline

Originals are moved by rotating the feeding belt using the belt motor (M2). The direction of their movement is either to the right or left depending on the selected operation mode.

Originals are delivered by rotating the delivery roller using the delivery motor (M5).

Originals are always delivered to the original delivery tray.

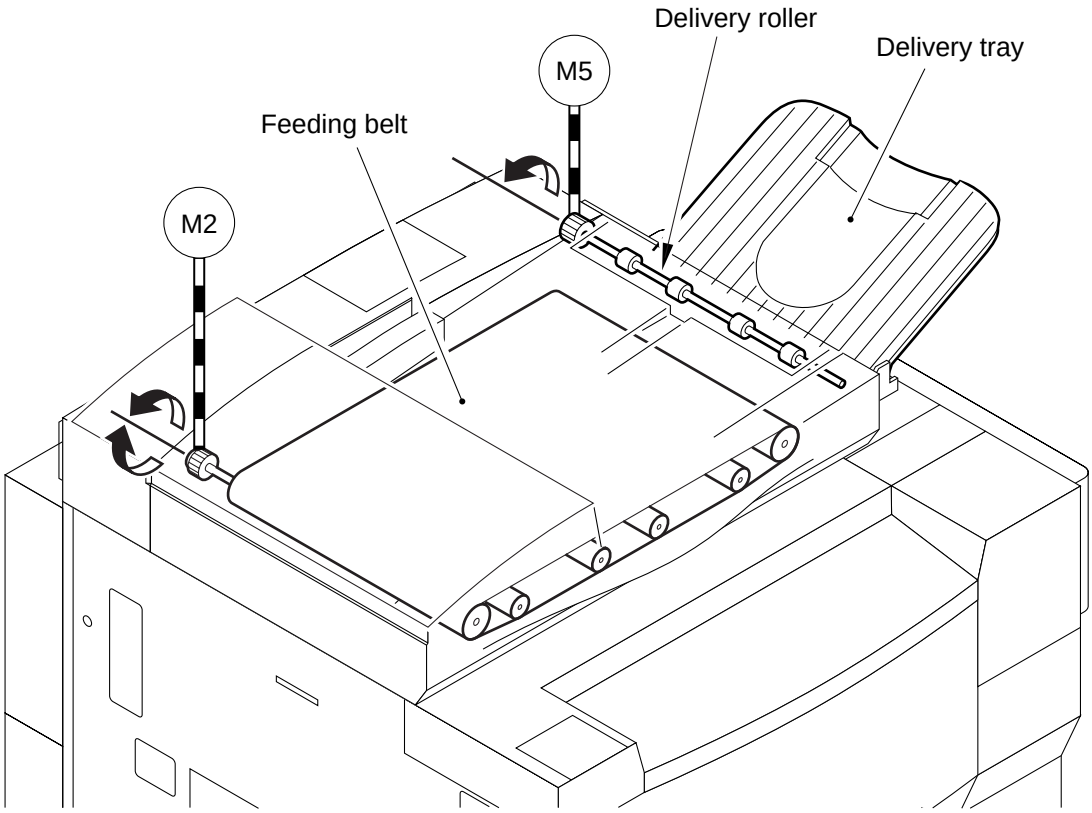

Figure 2-229

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2. Controlling the Belt Motor (M2)

Figure 2-230 shows the circuit to control the belt motor (M2). The belt motor is a 4-phase stepping motor, and the circuit has the following functions:

- Turning on and off the motor.
- Controlling the direction of motor rotation.
- Controlling the speed of motor rotation.

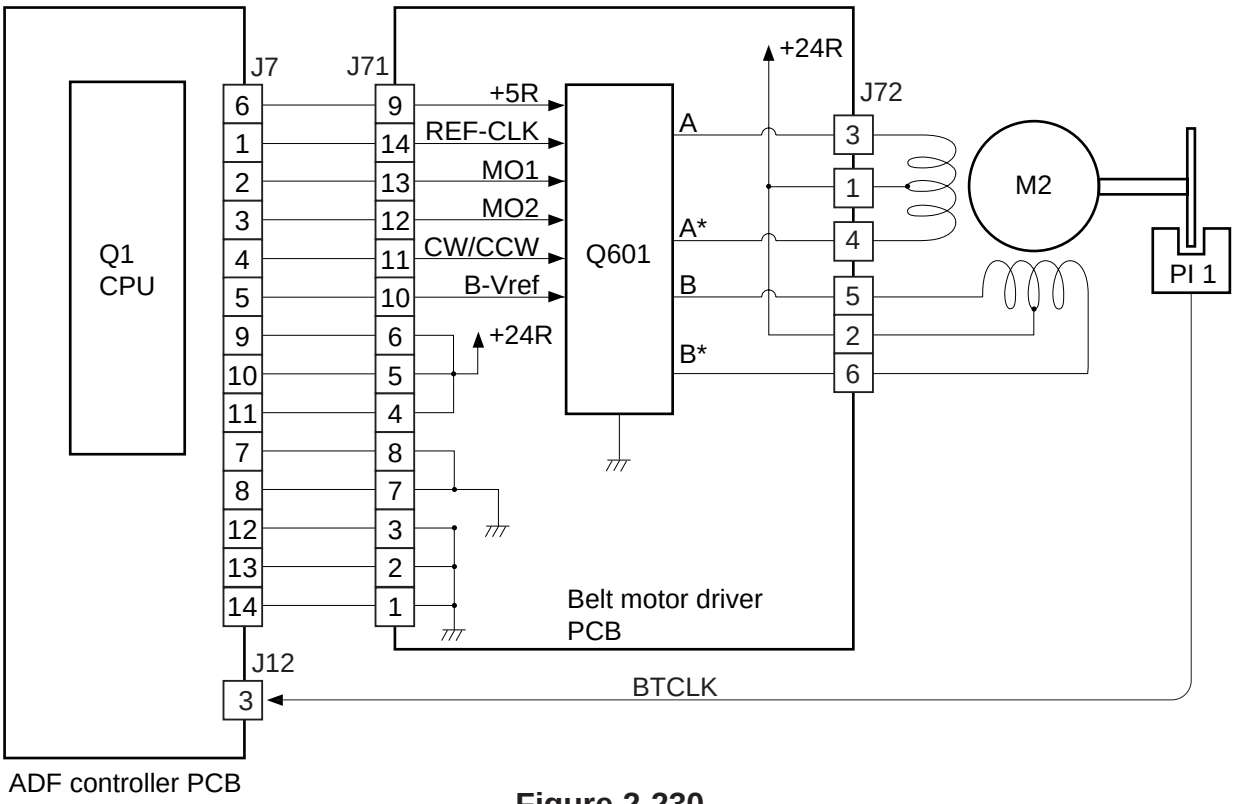

Figure 2-230

The CPU (Q1) on the ADF controller PCB sends the appropriate motor control signal to the belt motor driver PCB. The belt motor driver PCB, in response, controls each specific motor according to the signal.

Signal	Description
REF-CLK	Serves as reference clock pulses.
MO1	Sets motor operation mode.
MO2	Sets motor operation mode.
CW/CCW	Sets direction of rotation.
B-Vref	Sets motor torque.
BTCLK	Monitors motor operation, Sets belt stop position.

Table 2-213

Related Error Code

E402	• Error in the belt motor (M2) • Error in the belt motor clock sensor (PI1) • Error in the ADF controller PCB

3. Controlling the Delivery Motor (M5)

Figure 2-231 shows the circuit used to control the delivery motor (M5). The delivery motor is a DC motor, and the circuit has the following functions:

- Turning on and off the motor.
- Controlling the rotation speed of the motor.

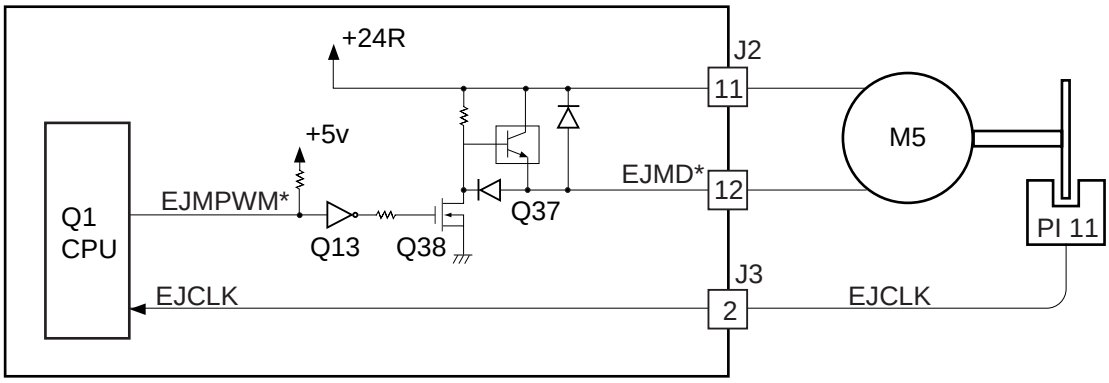

Figure 2-231

The CPU (Q1) on the ADF controller PCB sends the motor rotation speed signal (EJMPWM*) to the drive control assembly, which in response generates the motor drive signal (EJMD*).

The motor rotation signal (EJCLK) occurs when the motor rotates, used by the CPU to monitor the operation of the motor.

Signal	Description
EJMPWM *	Controls motor rotation.
EJMD *	Controls motor drive.
EJCLK	Monitors motor operation.

Table 2-214

Related Error Code

E404	• Error in the delivery motor (M5) • Error in the delivery motor clock sensor (PI11) • Error in the ADF controller PCB

Related Adjustments

Sensor and delivery motor	Perform when replacing the delivery sensor.

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F. CW Rotation Pickup/Delivery

1. Outline

The operation referred to as "CW rotation pickup/delivery" is performed during copying in fixed or stream reading mode.

	Operation mode	Copying mode
CW rotation pickup/delivery	Fixed reading	Single-sided original → Single-sided copy (at 25% to 49%; 201% to 400%) Single-sided original → Double sided copy (at 25% to 49%; 201% to 400%)
	Stream reading	Single-sided original → Single-sided copy (at 50% to 150%) Single-sided original → Double-sided copy (at 50% to 150%)

Table 2-215

Caution:

The machine will always be in fixed reading mode for the following:

- if the copier is set to "priority on image" mode; or
- if the machine identifies the original to be a non-default size,

2. Fixing Reading Mode

In fixed reading mode, the machine keeps an original on the copyboard glass while the copier moves the scanner to make copies.

a. Small-Size Single-Sided Original

1] The first original is picked up, and its leading edge is butted against the registration roller to remove the skew. (For details of pickup operation, see D. "Original Pickup/ Separation" on p. 2-24.)

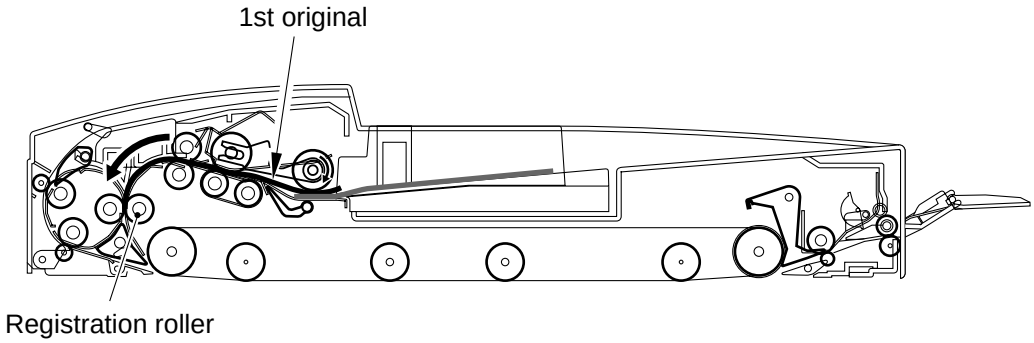

Figure 2-232

2] The registration roller and the feeding belt are rotated to move the first original.
When the trailing edge of the first original leaves the separation sensor (S4), the second original is picked up. (advance pickup)

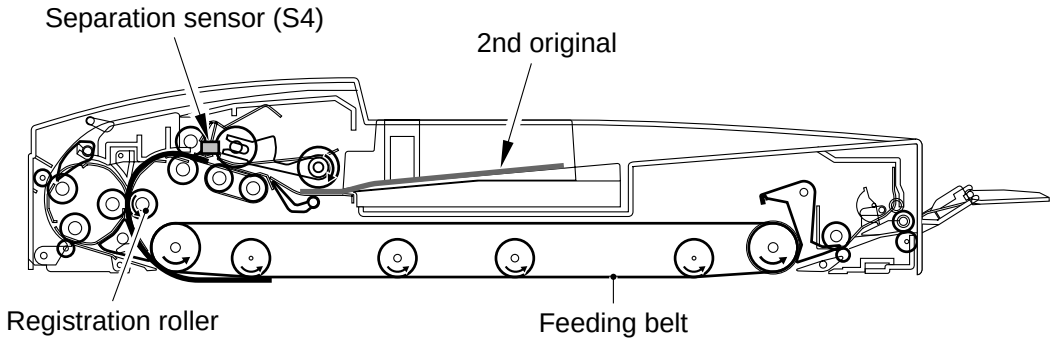

Figure 2-233

3] The registration roller and the feeding belt is rotated to move the first original.
The first original is moved over a specific distance by the feeding belt after its trailing edge has moved past the pre-registration roller sensor (S2), and is then stopped.

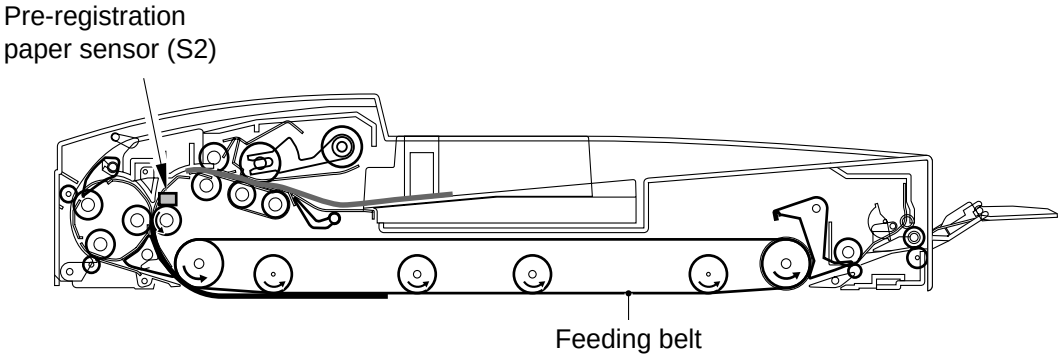

Figure 2-234

4] The copier makes a copy by moving its scanner.

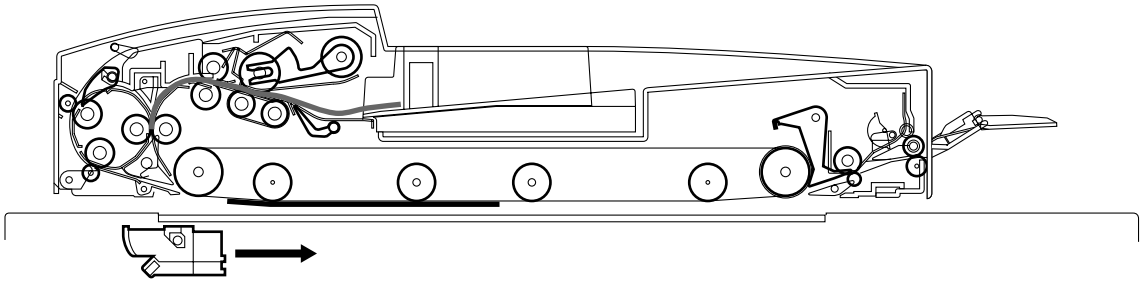

Figure 2-235

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5] When the copier's scanner starts to move in reverse, the feeding belt is rotated to move the first original in the direction of delivery.
At the same time, the registration roller is rotated to move the second original.

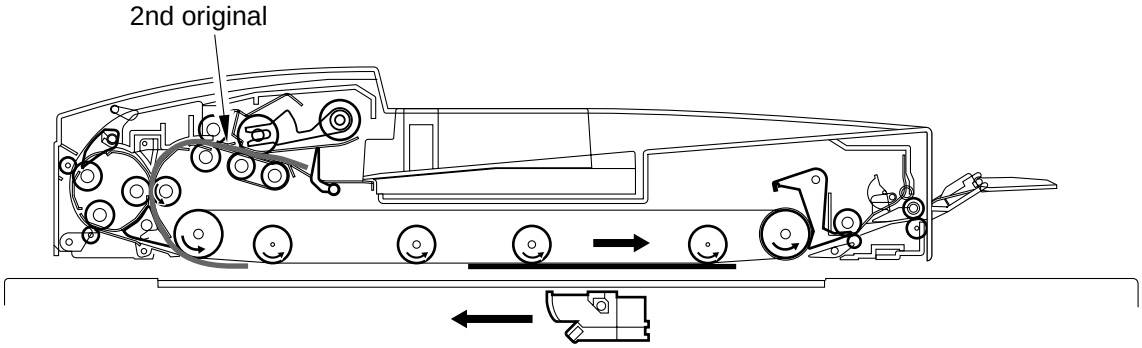

Figure 2-236

6] The first and second originals are moved by the feeding belt; after the trailing edge of the second original has moved past the pre-registration roller sensor (S2), the feeding belt is rotated for a specific length to stop the second original.
The first original is moved in the direction of delivery, and is stopped on the copyboard glass.

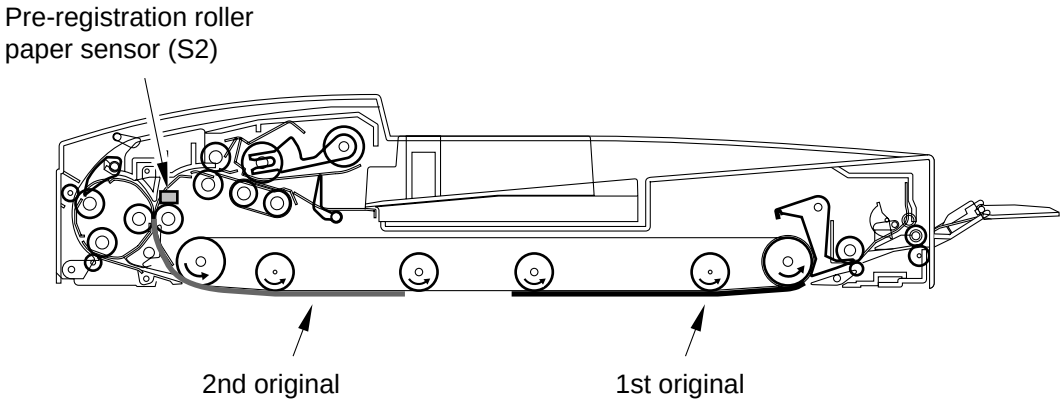

Figure 2-237

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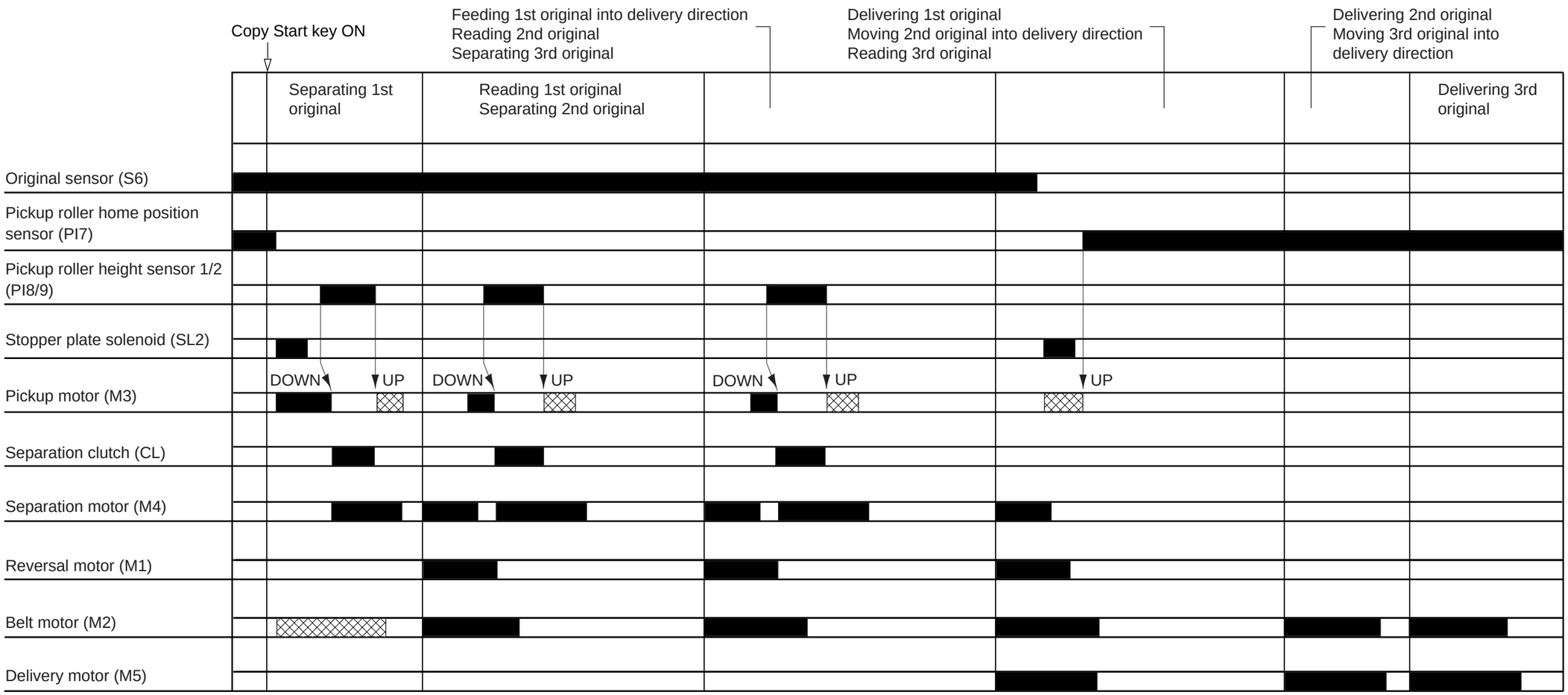
A4, 3 Single-Sided Originals, Fixed Reading



: motor CCW rotation.

Figure 2-238

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c. Large-Size Single-Sided Original

1] The first original is picked up, and its leading edge is butted against the registration roller to remove the skew. (For details of pickup operation, see D. "Original Pickup/ Separation" on p. 2-24.)

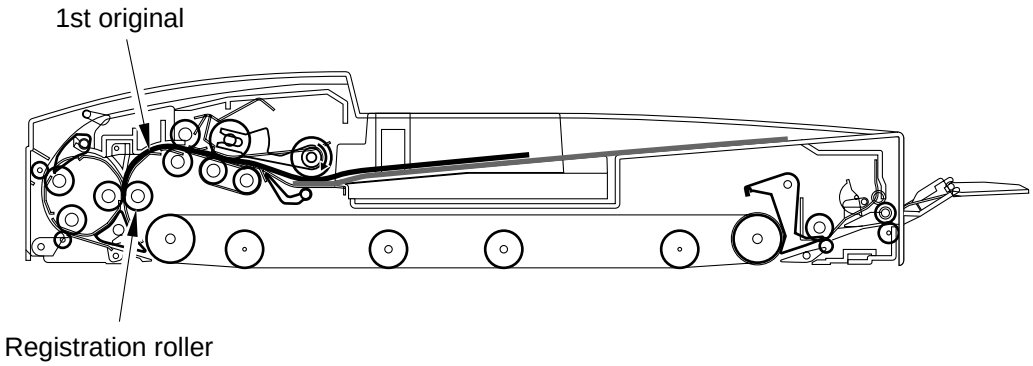

Figure 2-239

2] The registration roller and the feeding belt are rotated to move the original.
When the trailing edge of the first original moves past the separation sensor (S4), the second original is picked up.

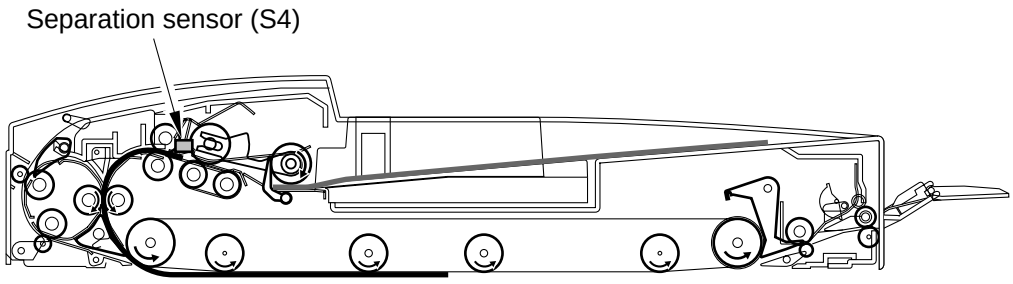

Figure 2-240

3] The registration roller and the feeding belt are rotated to move the original.
The first original is moved for a specific length after its trailing edge has moved past the pre-registration roller paper sensor (S2), and is stopped.

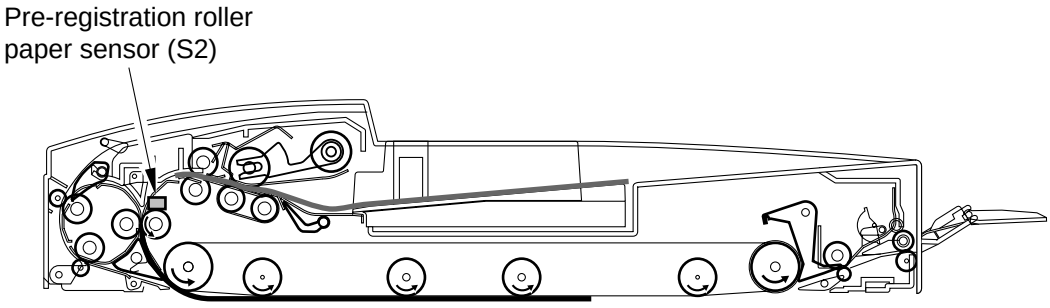

Figure 2-241

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4] The copier starts to make a copy by moving its scanner.

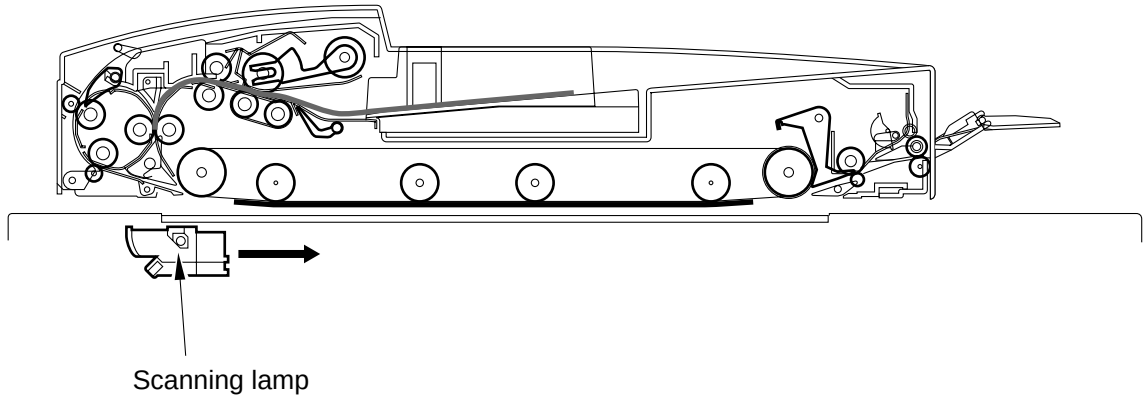

Figure 2-242

5] When the copier's scanner starts to move in reverse, the feeding belt is rotated to move the first original in the direction of delivery.
At the same time, the second original is picked up.

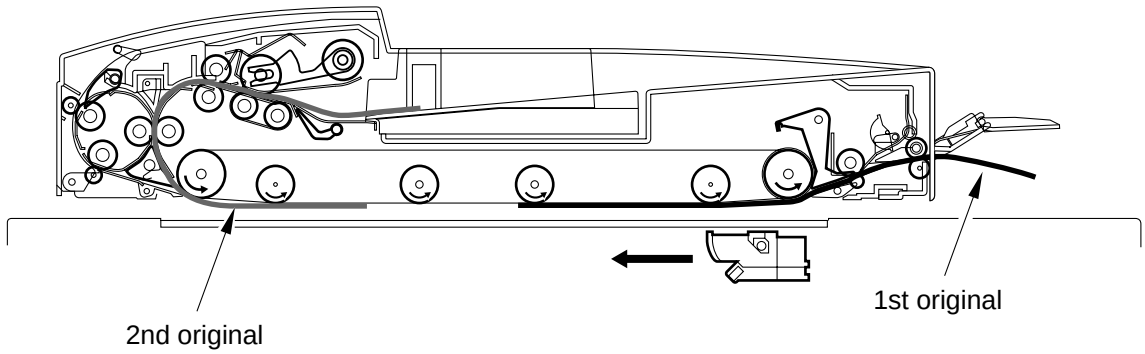

Figure 2-243

6] The first and second originals are moved by the feeding belt; the feeding belt is rotated for a specific length after the trailing edge of the second original has moved past the pre-registration roller paper sensor (S2) to stop the second original at a specific position.
The first original is delivered by the delivery roller.

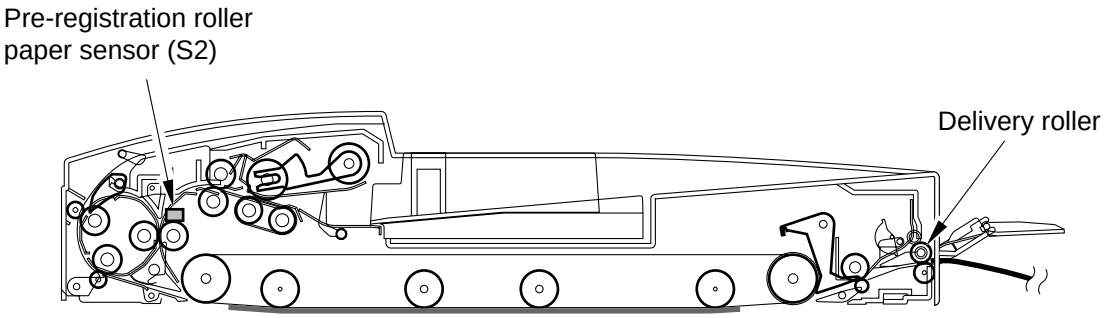

Figure 2-244

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d. Sequence of Operations (large size)

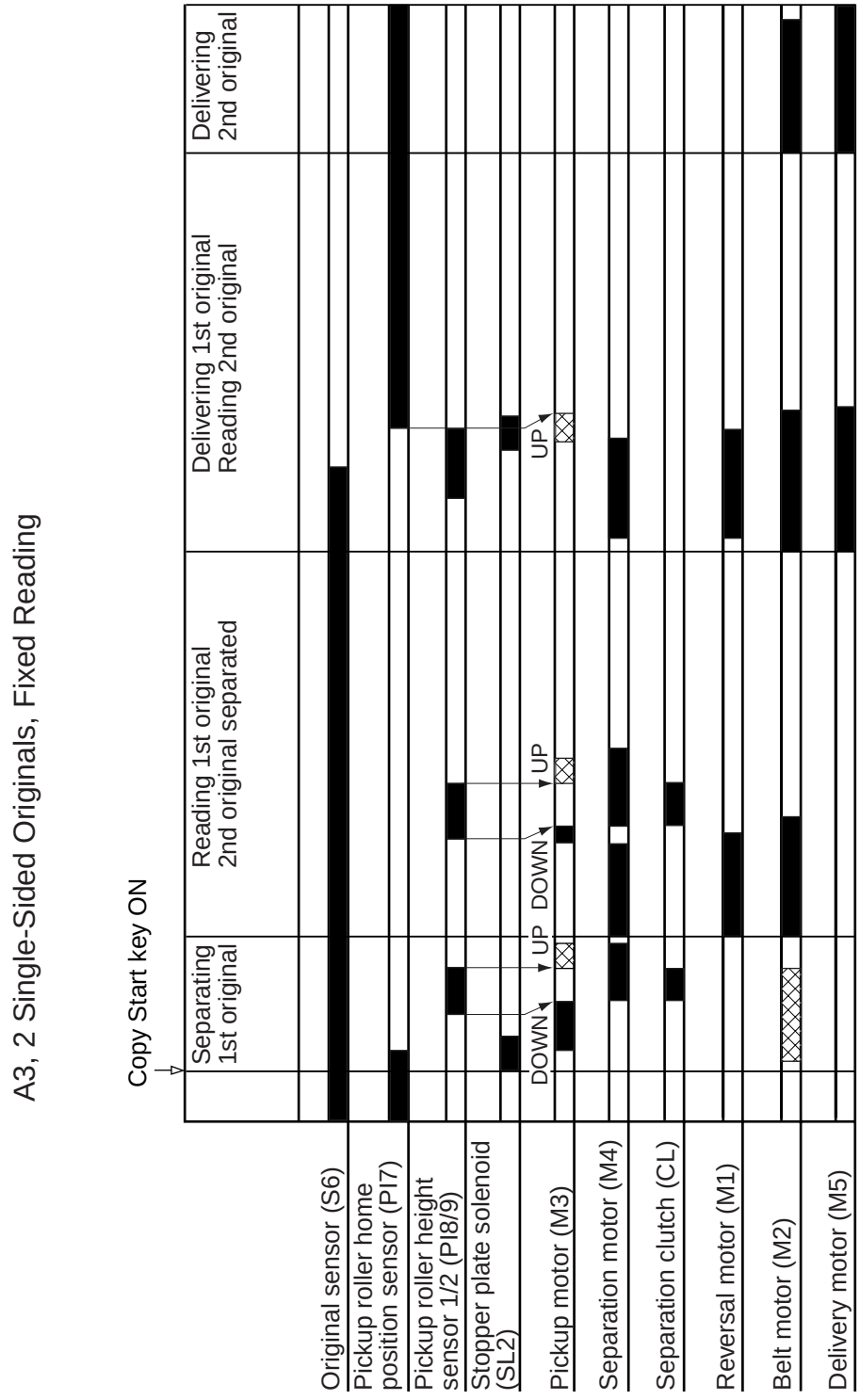

Figure 2-245

3. Stream Reading

In stream reading mode, the copier keeps its scanner fixed, and originals are moved over the copyboard glass for copying.

a. Small-Size Original

1] The first original is picked up, and its leading edge is butted against the registration roller to remove the skew. (For details of pickup operation, see D. "Original Pickup/ Separation" on p. 2-24.)

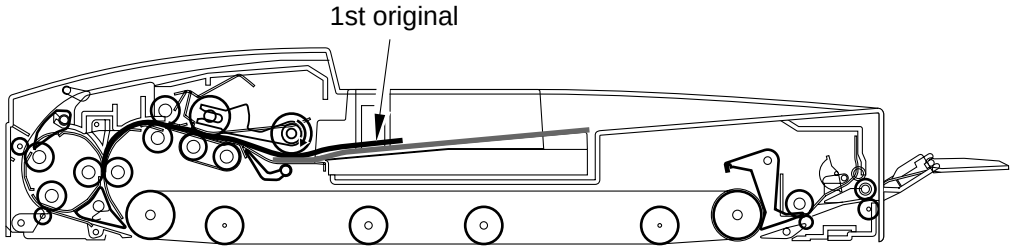

Figure 2-246

2] The registration roller and the feeding belt are rotated to move the original.
When the trailing edge of the 1st original moves past the separation sensor (S4), the second original is picked up.

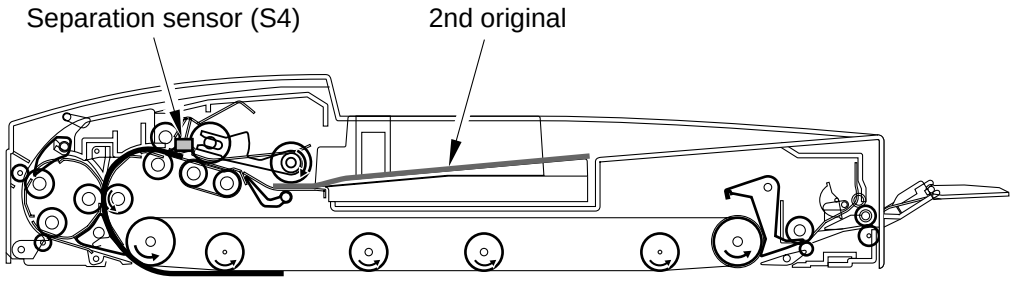

Figure 2-247

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3] The first original is moved by the feeding belt for a specific length after its leading edge has moved past the post-registration roller paper sensor (S3), and is stopped (in wait position).
(At this time, measurement is started to find out the distance the first original moves after it has passed the pre-registration roller paper sensor (S2).)

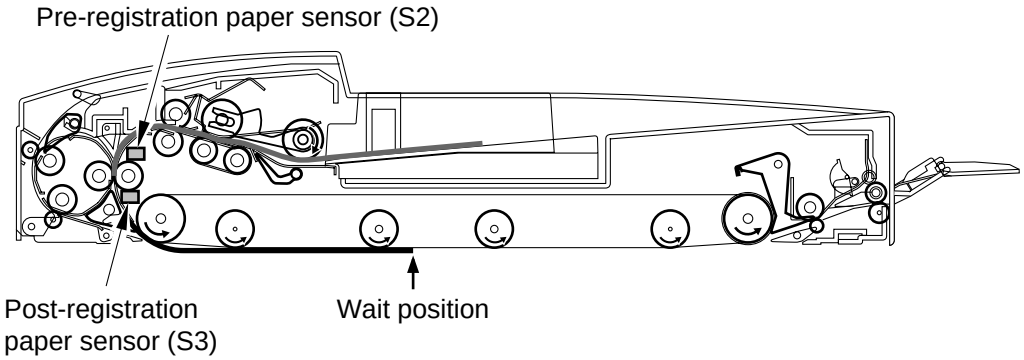

Figure 2-248

4] The feeding belt is rotated to move the original for a specific length.
When the first original has been moved for a specific length (as determined by the counts issued after the trailing edge of the original has moved past the pre-registration paper sensor (S2)), the machine sends the image leading edge signal to the copier.
In response, the copier starts reading the original. At this time, the second original is moved, and is stopped (in wait position).

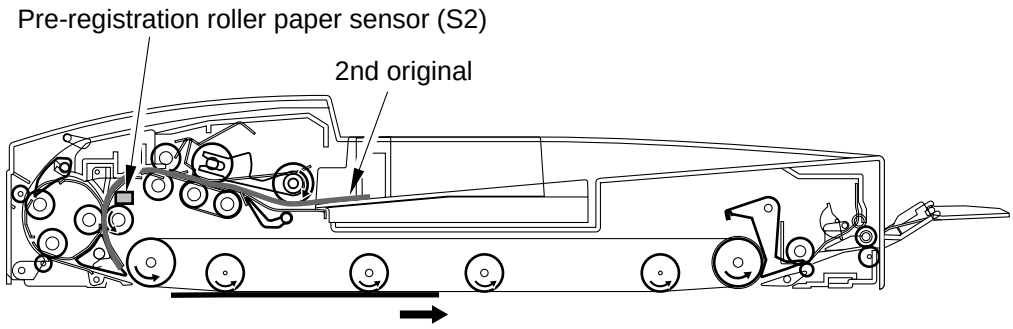

Figure 2-249

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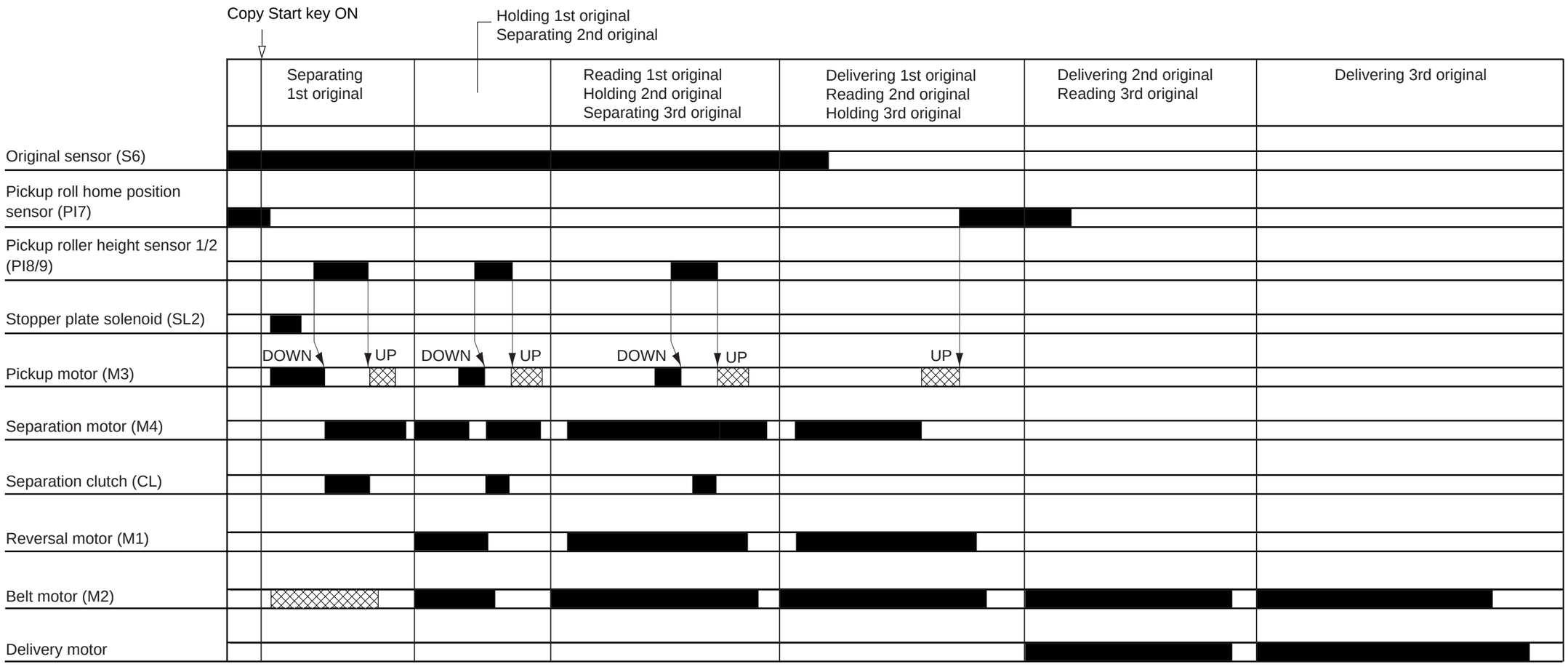
A4, 3 Single-Sided Originals, Stream Reading



: motor CCW rotation.

Figure 2-250

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c. Large-Size Original

1] The first original is picked up, and its leading edge is butted against the registration roller to remove the skew. (For details of pickup operation, see D. "Original Pickup/ Separation" on p. 2-24.)

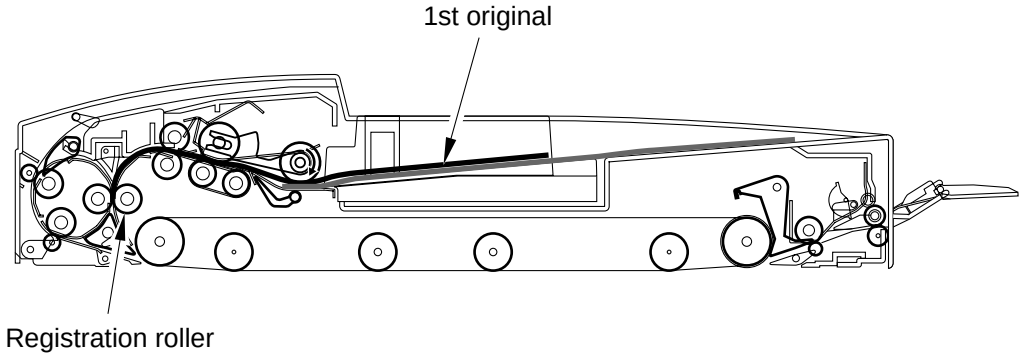

Figure 2-251

2] The registration roller and the feeding belt are rotated to move the original.
When the trailing edge of the first original moves past the separation sensor (S4), the second original is picked up. (If the original size is 279.4 × 431.8 mm (11"×17"), after the original is moved in step 4].)

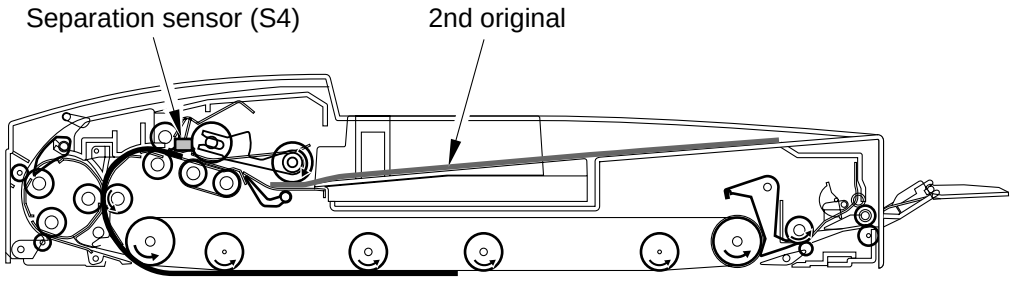

Figure 2-252

3] When the leading edge of the original has moved past the post-registration roller paper sensor (S3), the feeding belt is rotated for a specific length, and the original is stopped (in wait position).
(At this time, the machine starts to track the distance of travel after the first original moves past the pre-registration roller paper sensor (S2).)

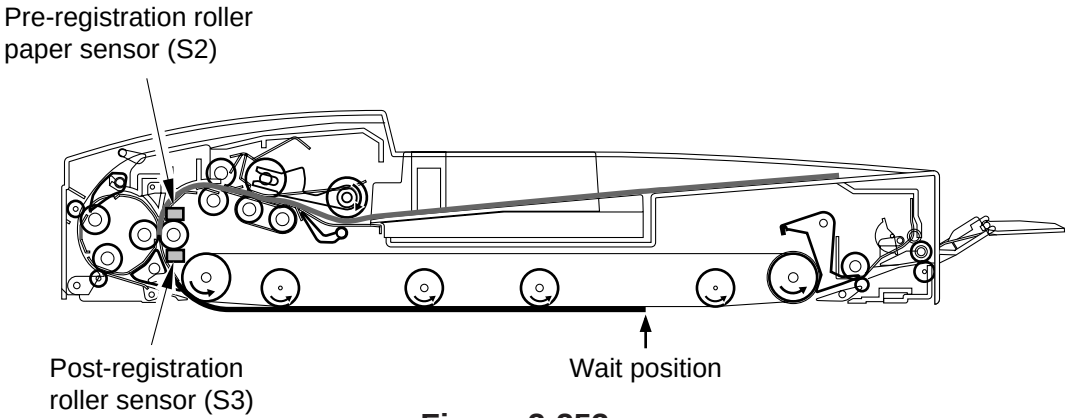

Figure 2-253

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4] The feeding belt is rotated to move the original.
When the original has been moved for a specific length (in reference to the counts generated after the trailing edge of the original has moved past the pre-registration roller paper sensor (S2)), the machine sends the image leading edge signal to the copier, which in response starts reading the original.
At this time, the second original is also moved and stopped at wait position.

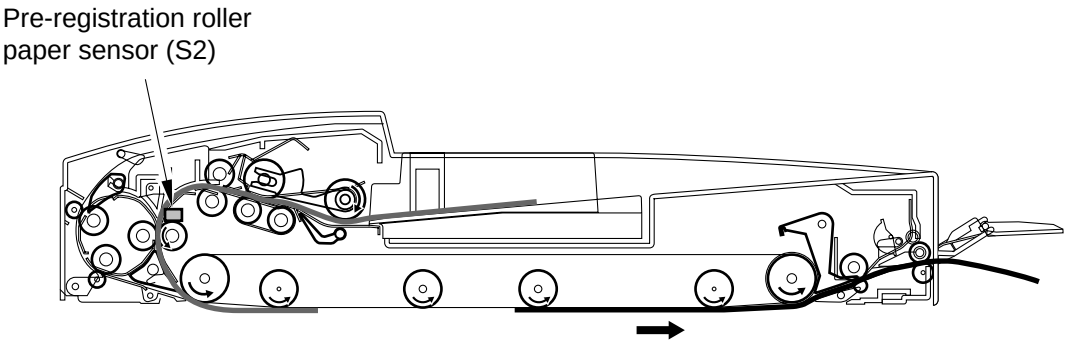

Figure 2-254

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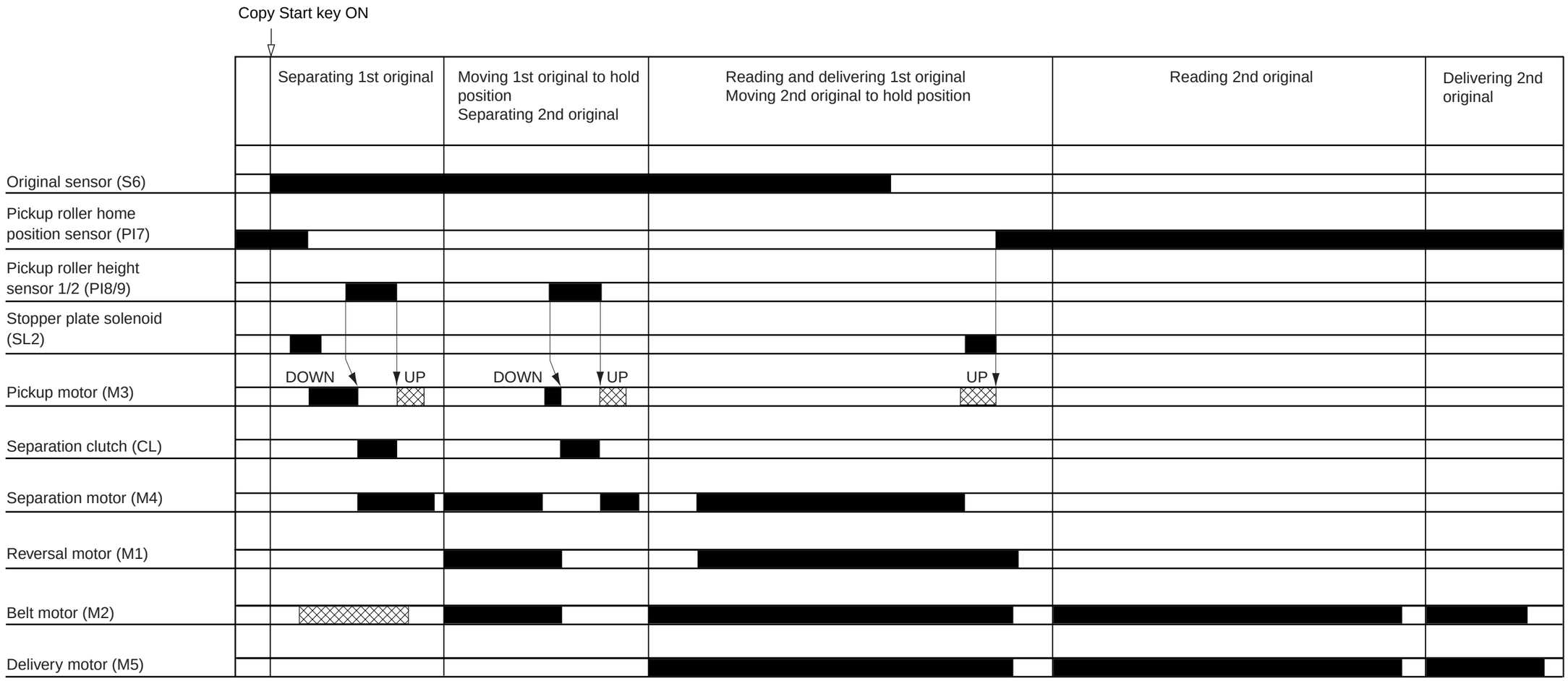
A3, 2 Single-Sided Originals, Stream Reading



: motor CCW rotation.

Figure 2-255

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G. Pre-Reversal Pickup/Delivery

1. Outline

The operation referred to as "pre-reversal" is used to reverse a double-sided original in advance when moving it to the copyboard glass.

Pre-reversal pickup/delivery operation takes place when copying small-size double-sided originals, and its reading mode is always fixed reading.

	Operation mode	Copying mode
Pre-reversal pickup/delivery	Fixed reading copying	Double-sided original → Single-sided copy (at 25% to 400%) Double-sided original → Double-sided copy (at 25% to 400%)

Table 2-216

2. Operation

1] The first original is picked up, and its leading edge is butted against the registration roller to remove the skew. (For details of pickup operation, see D. "Original Pickup/ Separation" on p. 2-24.)

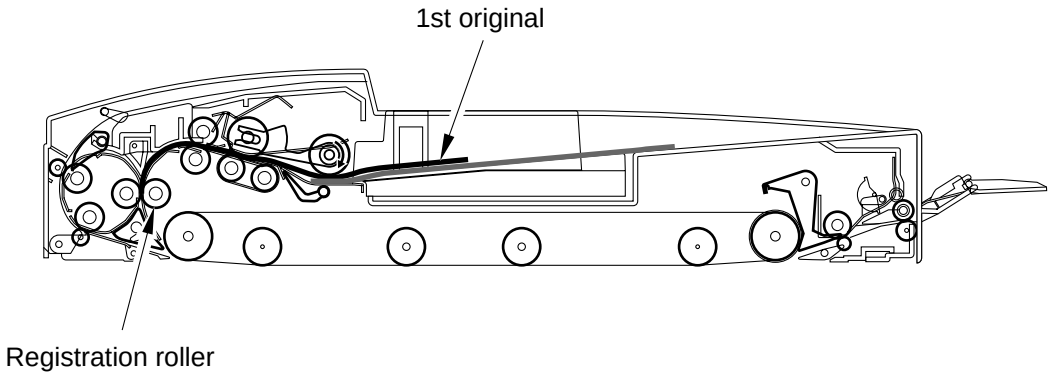

Figure 2-256

2] The registration roller and the reversing roller are driven to reverse the original in advance. The first original is moved by the reversing roller for a specific length after its trailing edge has moved past the pre-registration paper sensor (S2), and is stopped.

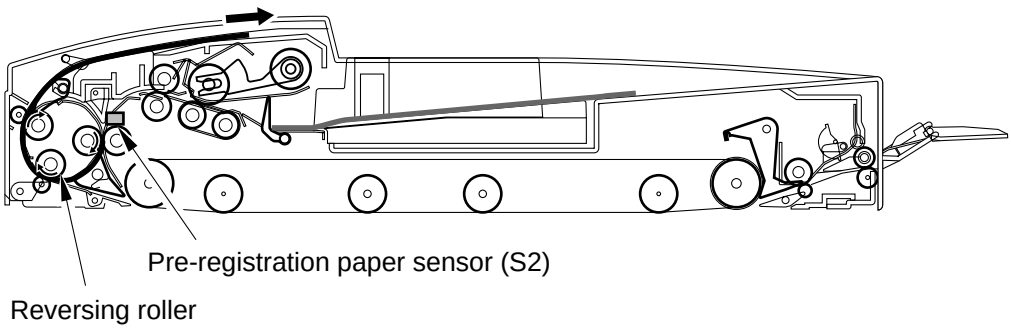

Figure 2-257

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3] The reversing roller and the feeding belt are rotated to move the original.
The feeding belt is rotated after the trailing edge of the first original has moved past the reversal sensor (S1), and the original is stopped.

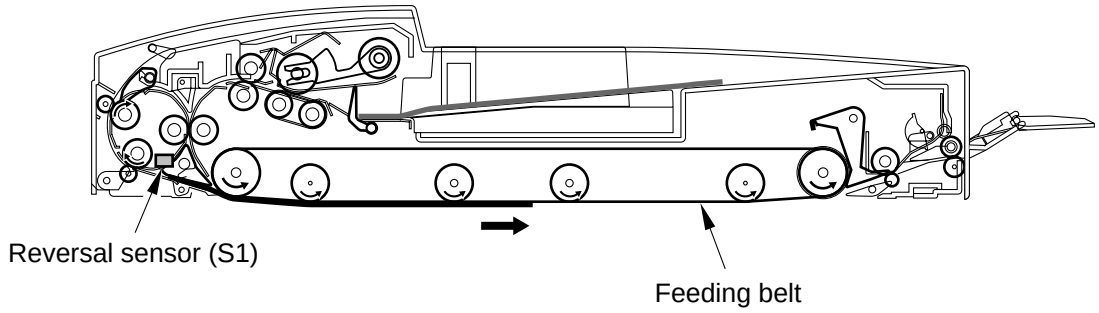

Figure 2-258

4] The copier starts to make a copy by moving its scanner.

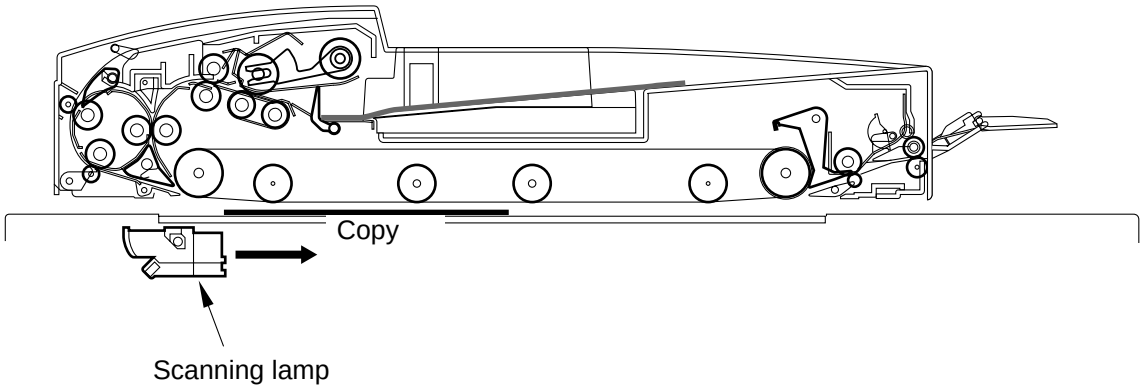

Figure 2-259

5] When the copier's scanner starts to move in reverse, the feeding belt is rotated to move the first original to the reversing assembly. At this time, the leading edge of the original is butted against the reversing roller to remove the skew.

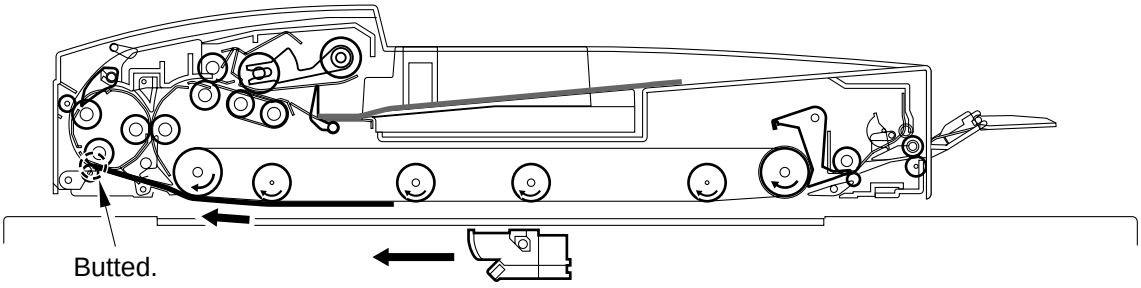

Figure 2-260

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6] The reversing roller and the feeding belt are rotated to move the original to the copyboard glass.
The first original is moved for a specific length after its trailing edge has moved past the pre-registration roller paper sensor (S2), and is stopped.

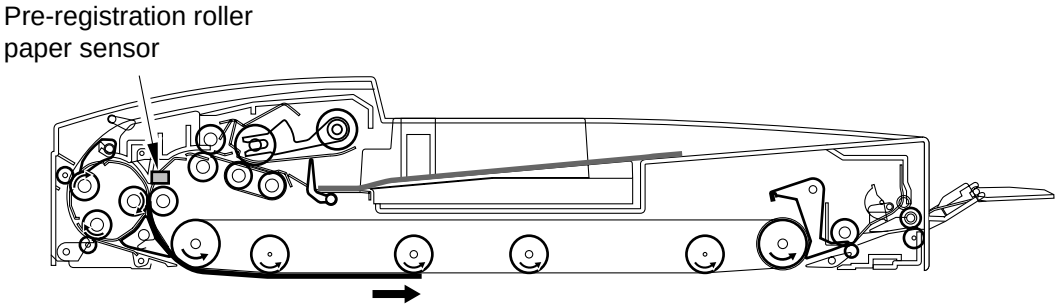

Figure 2-261

7] The copier's scanner starts to make a copy.
At this time, the second original is picked up and reversed in advance. (See steps 1] and 2].)

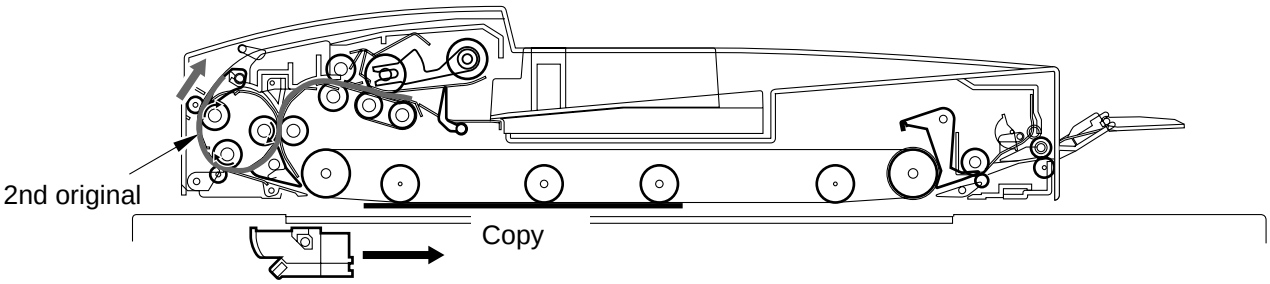

Figure 2-262

8] When the copier's scanner starts to move in reverse, the reversing roller and the feeding belt are rotated to move the first and second originals.

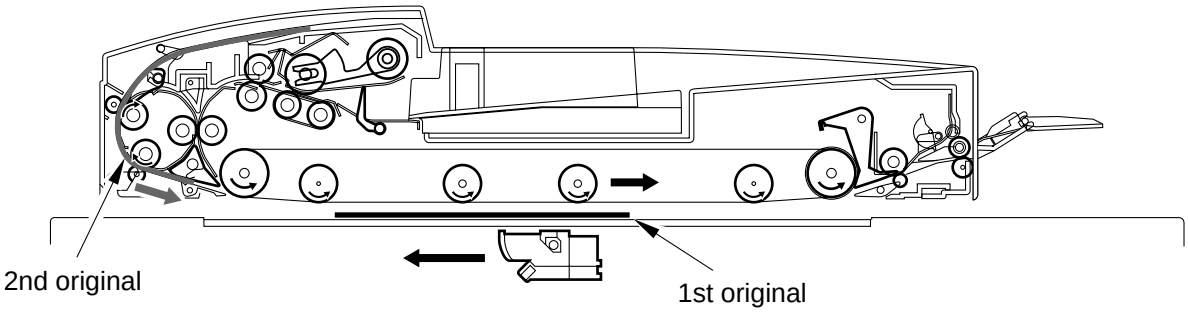

Figure 2-263

9] The feeding belt is rotated for a specific length after the second original has moved past the reversal sensor (S1), and the original is stopped.

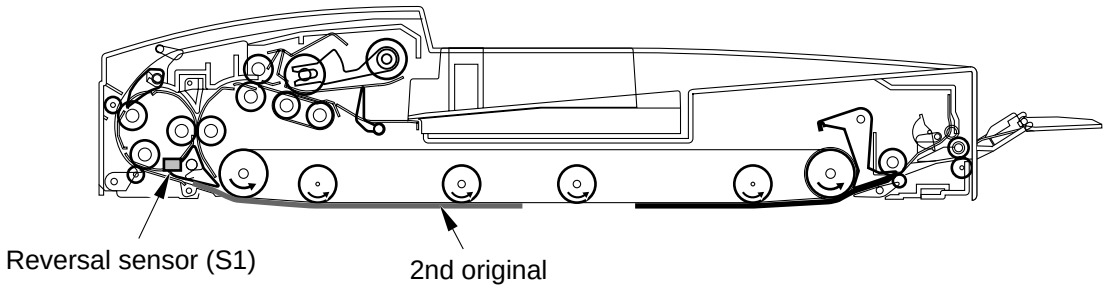

Figure 2-264

10] The copier starts to make a copy by moving its scanner.

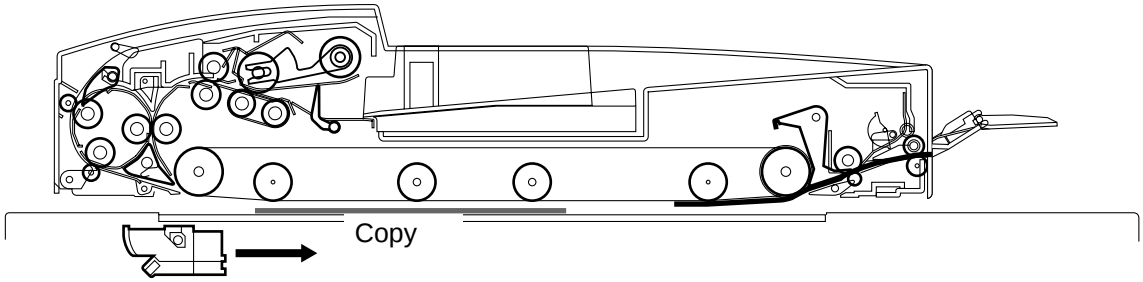

Figure 2-265

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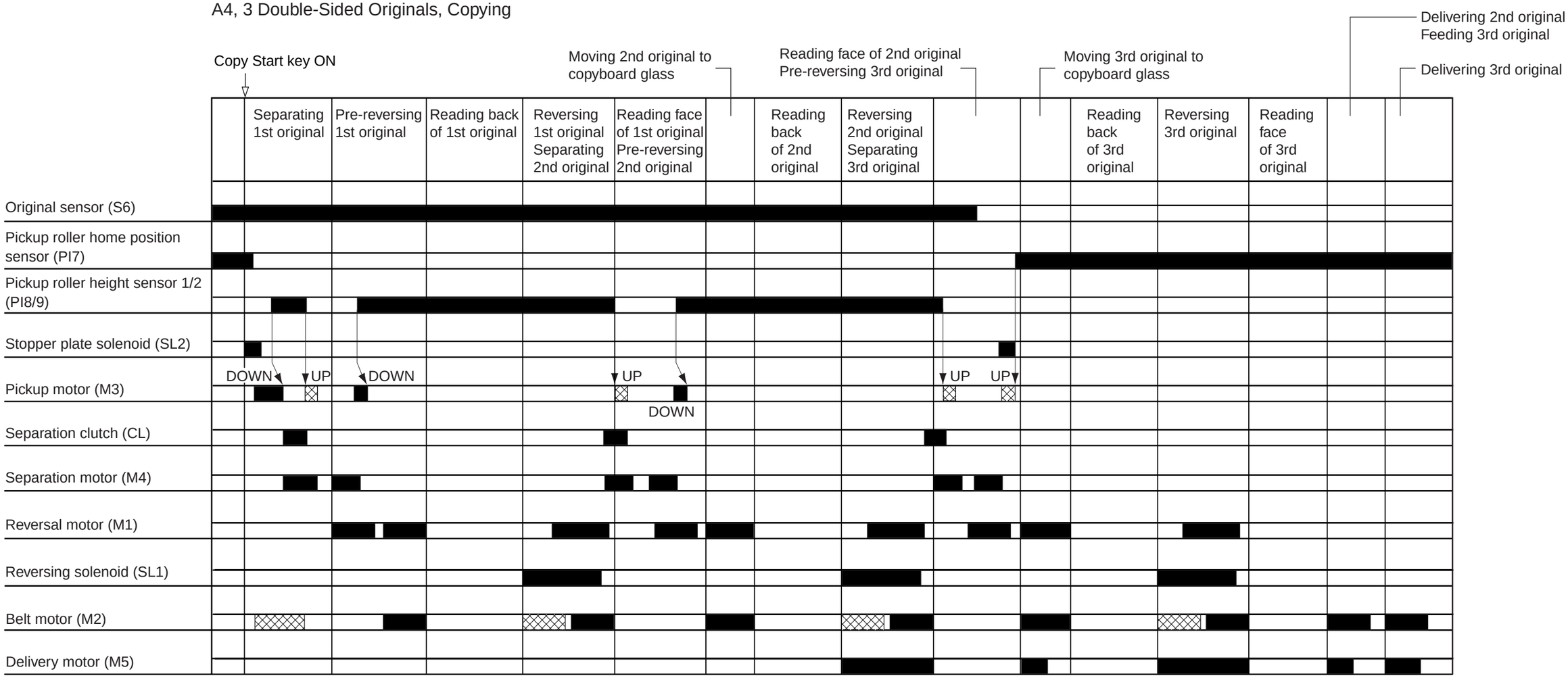
A4, 3 Double-Sided Originals, Copying



: motor CCW rotation.

Figure 2-266

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H. Reversal Pickup/Delivery

1. Outline

Reversal pickup/delivery operation takes place when copying large-size double-sided originals, and its reading mode is always fixed reading.

	Operation mode	Copying mode
Reversal pickup/ delivery	Fixed reading copying	Double-sided original → Single-sided original (at 25% to 400%) Double-sided original → Double-sided copy (at 25% to 400%)

Table 2-217

2. Operation

1] The first original is picked up, and its leading edge is butted against the registration roller to remove the skew. (For details of pickup operation, see D. "Original Pickup/ Separation" on p. 2-24.)

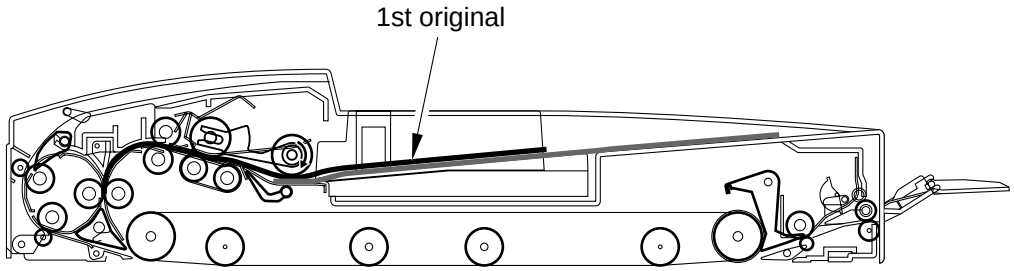

Figure 2-267

2] The reversing roller and the feeding belt are driven to move the original.
The first original is moved for a specific length by the feeding belt after its trailing edge has moved past the pre-registration roller paper sensor (S2), and is stopped.

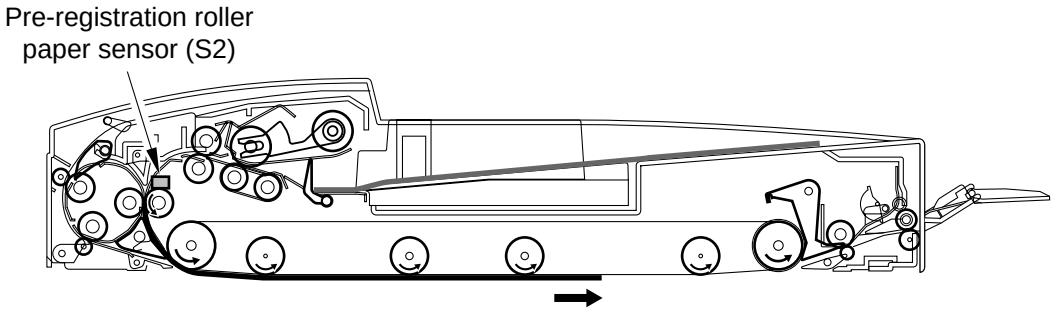

Figure 2-268

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3] The feeding belt is rotated to move the original to the reversing assembly. At this time, the leading edge of the first original is butted against the reversing roller to remove the skew.

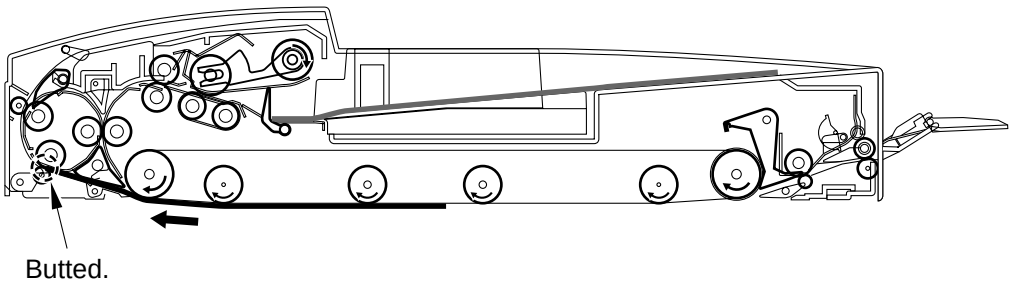

Figure 2-269

4] The reversing roller and the feeding belt are rotated to move the original to the copyboard glass.
The first original is moved for a specific length by the feeding belt after its trailing edge has moved past the pre-registration roller sensor (S2), and is stopped.

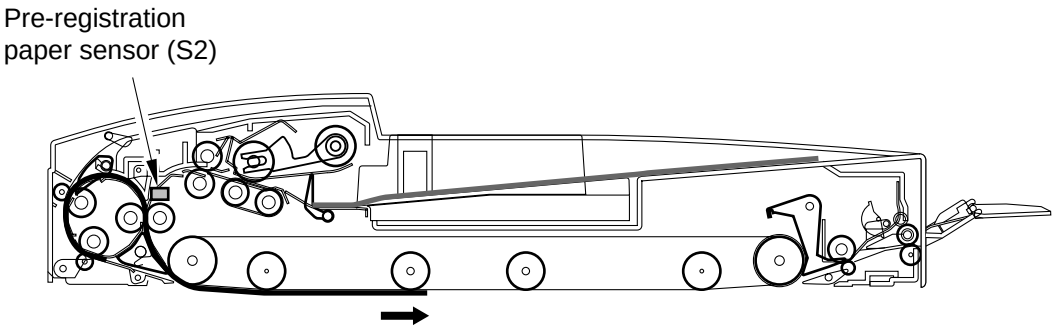

Figure 2-270

5] The copier's scanner starts to make a copy.

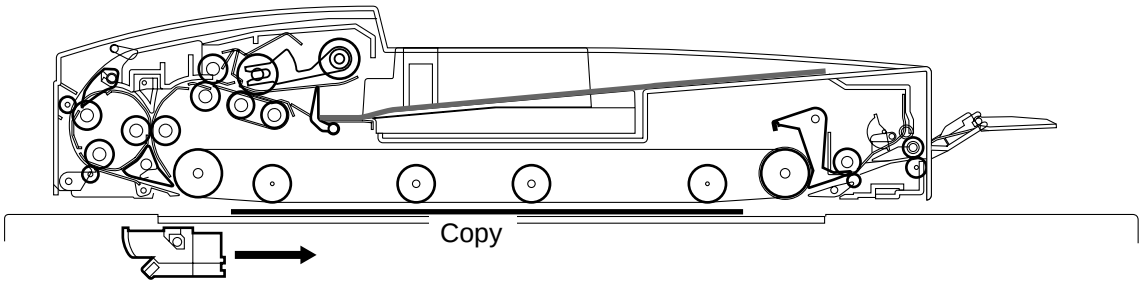

Figure 2-271

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6] When the copier's scanner starts to move in reverse, the feeding belt is rotated to move the first original to the reversing assembly. At this time the leading edge of the original is butted against the reversing roller to remove the skew.

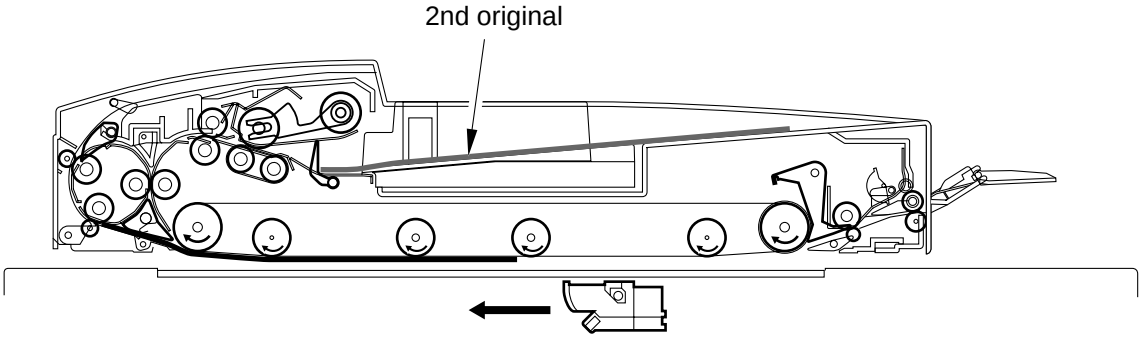

Figure 2-272

7] The reversing roller and the feeding belt are rotated to move the original to the copyboard glass.
The first original is moved for a specific length by the feeding belt after its trailing edge has moved past the pre-registration roller paper sensor (S2), and is then stopped.

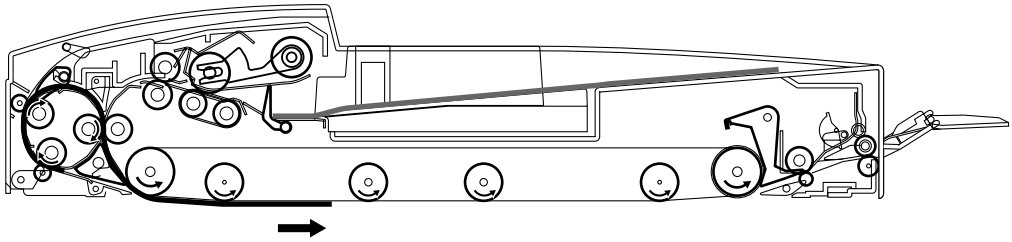

Figure 2-273

8] The copier starts to make a copy by moving its scanner.
At this time, the second original is picked up, and its leading edge is butted against the registration roller.

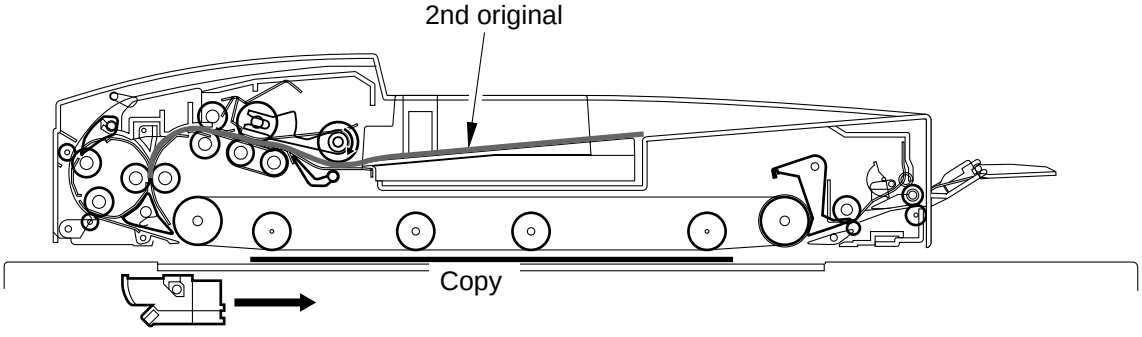

Figure 2-274

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9] The second original is moved for a specific length by the feeding belt after it has moved past the pre-registration roller paper sensor (S2), and is then stopped. The first original is delivered by the delivery roller.

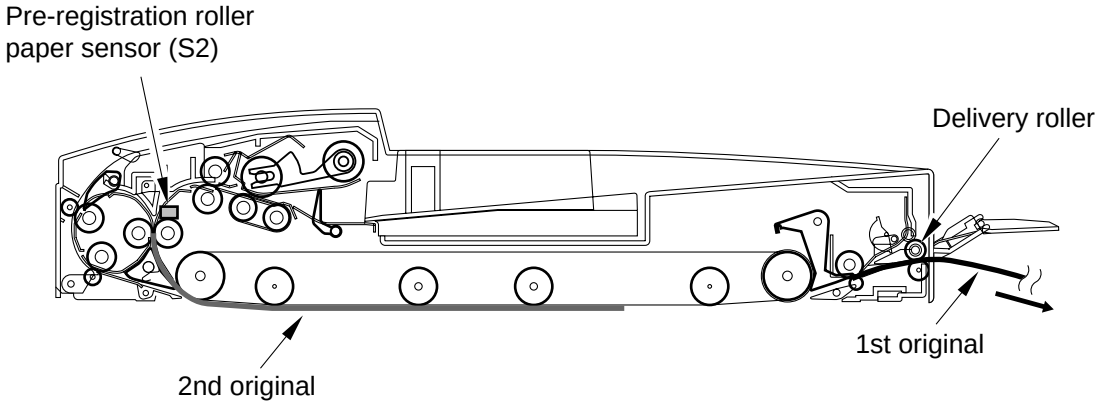

Figure 2-275

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3. Controlling the Reversal Motor (M1)

Figure 2-276 shows the circuit used to control the reversal motor (M1). The belt motor is a 4-phase stepping motor, and the circuit has the following functions:

- Turning on and off the motor.
- Controlling the direction of motor rotation.
- Controlling the speed of motor rotation.

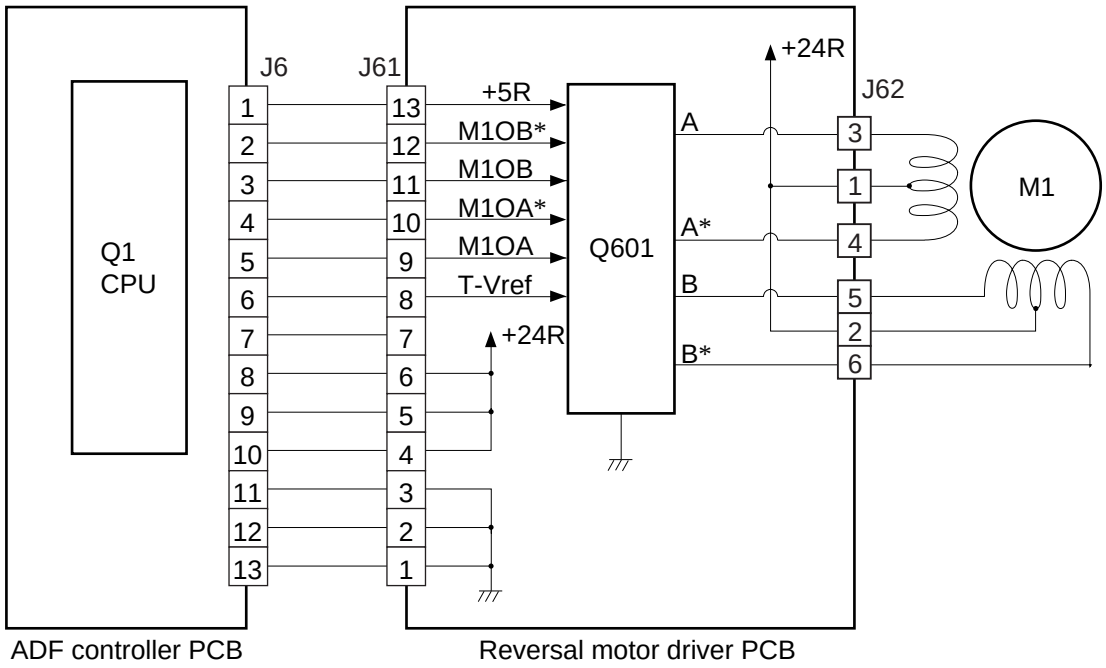

Figure 2-276

The CPU (Q1) on the ADF controller PCB sends various motor control signals to the reversal motor driver PCB. In response, the reversal motor driver PCB controls the respective motors to suit the incoming signals.

Signal	Function
M10A	Performs phase control. (direction and speed of rotation)
M10A*	Performs phase control. (direction and speed of rotation)
M10B	Performs phase control. (direction and speed of rotation)
M10B*	Performs phase control. (direction and speed of rotation)
T-Vref	Sets motor rotation torque.

Table 2-218

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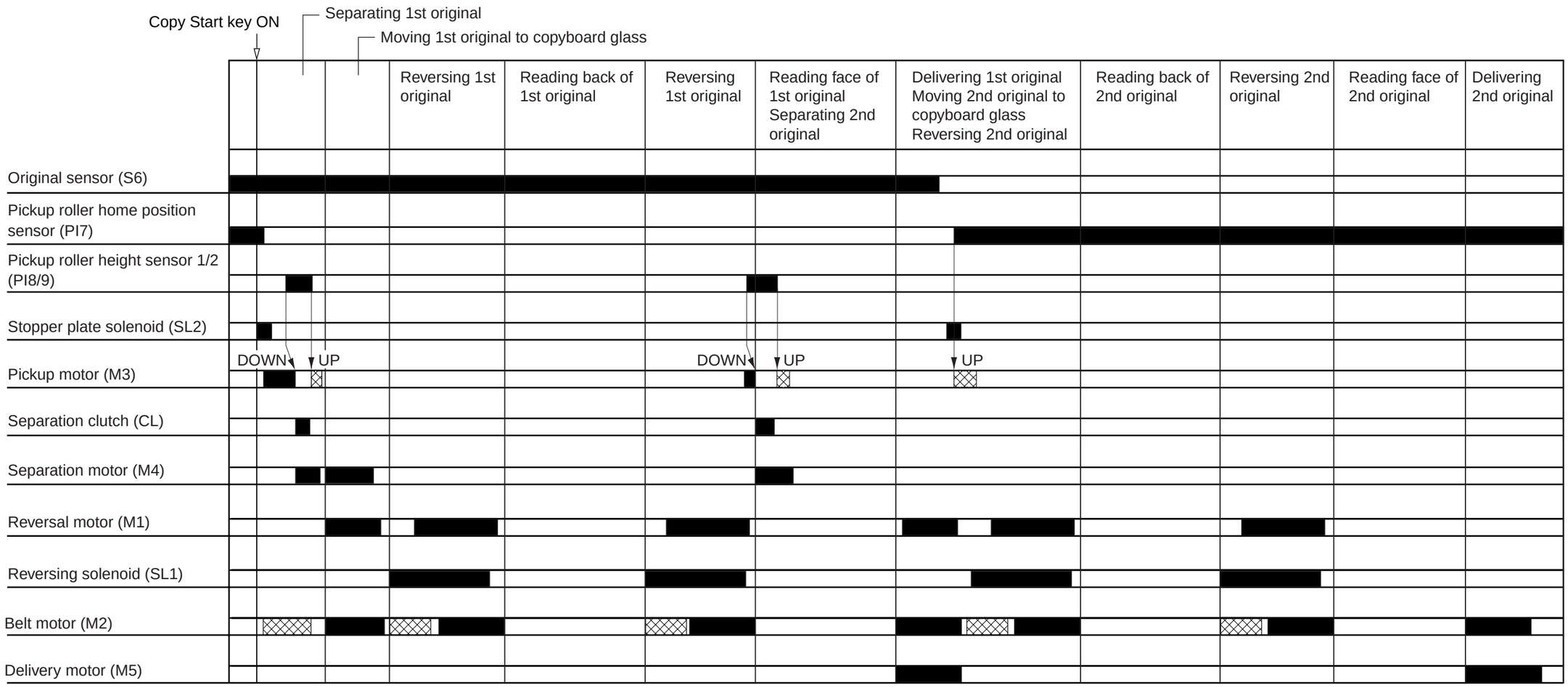
A3, 2 Double-Sided Originals, Copying



: motor CCW rotation.

Figure 2-277

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I. Manual Feeder Pickup/Delivery

1. Operation

In manual feeder pickup/delivery operation, reading mode is always fixed reading.

1] When an original is placed in the manual feeder, the manual set sensor (PI12) turns on to indicate the presence of an original.

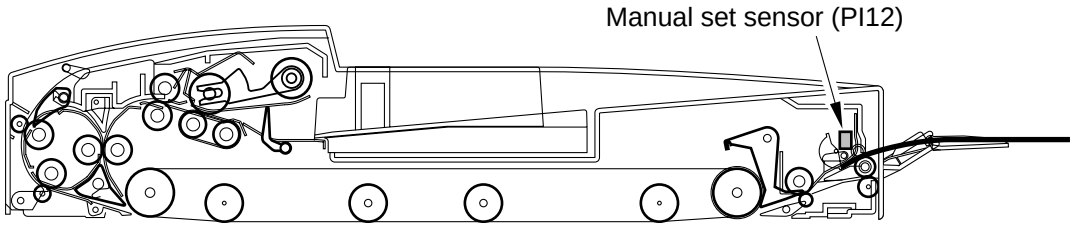

Figure 2-278

2] In about 0.3 sec, the original is moved by the delivery roller so that its leading edge butts against the registration roller (to remove the skew).

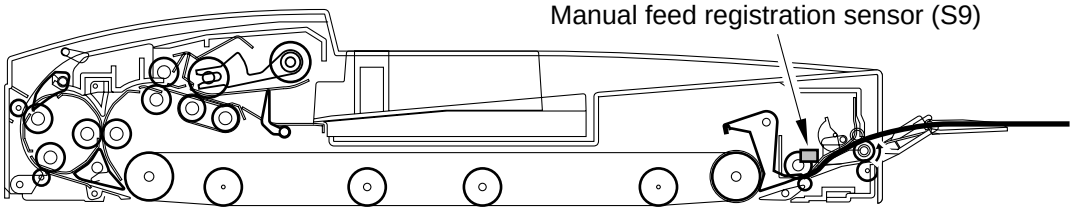

Figure 2-279

3] The original is moved by the delivery roller and the feeding belt. The original is stopped when its leading edge reaches the reversal sensor (S1).

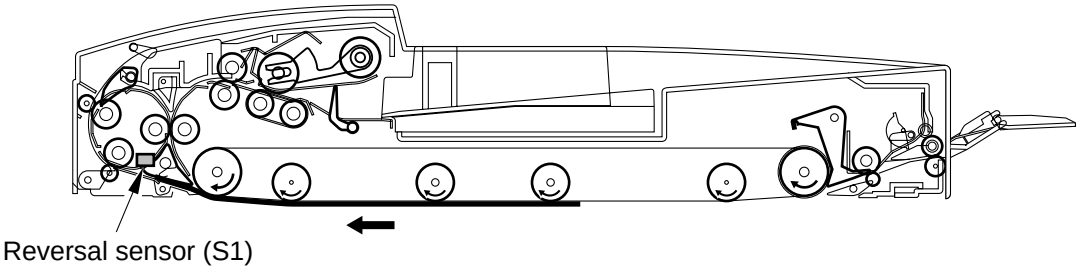

Figure 2-280

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4] The feeding belt is rotated to move the original. The original is moved for a specific length and stopped after its trailing edge has moved past the reversal sensor (S1).

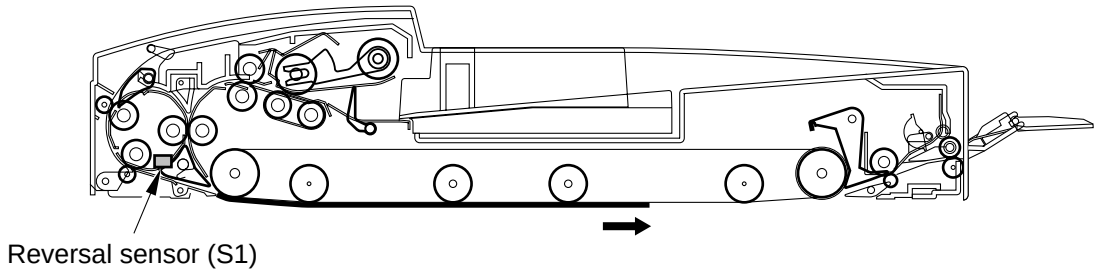

Figure 2-281

5] The copier starts to make a copy by moving its scanner.

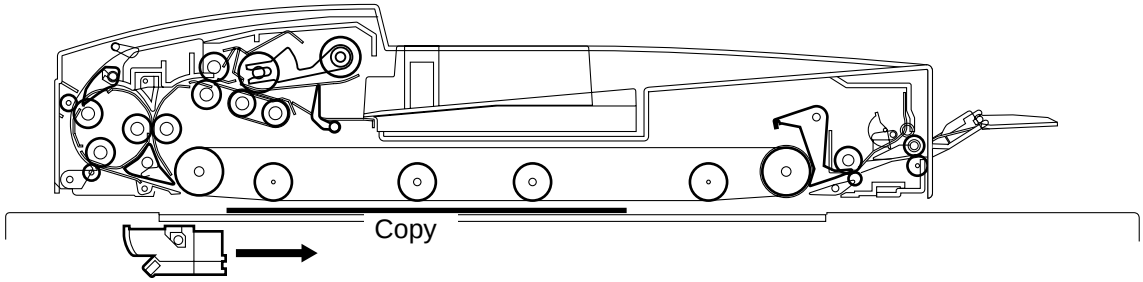

Figure 2-282

6] When the copier's scanner starts to move in reverse, the feeding belt and the delivery roller are rotated to move the original to the delivery assembly.

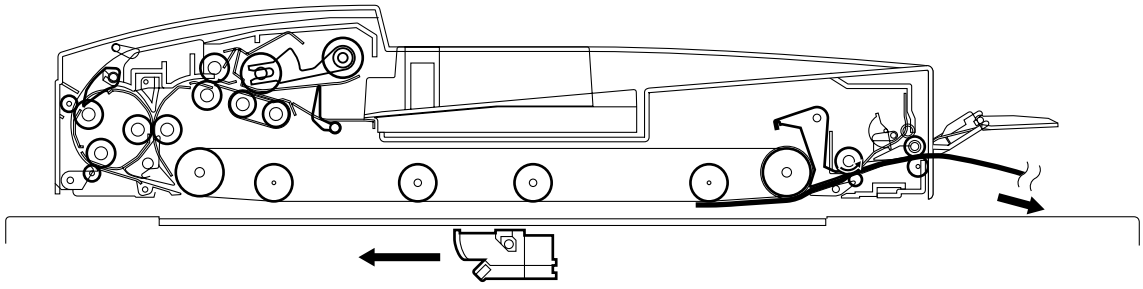

Figure 2-283

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2. Sequence of Operations

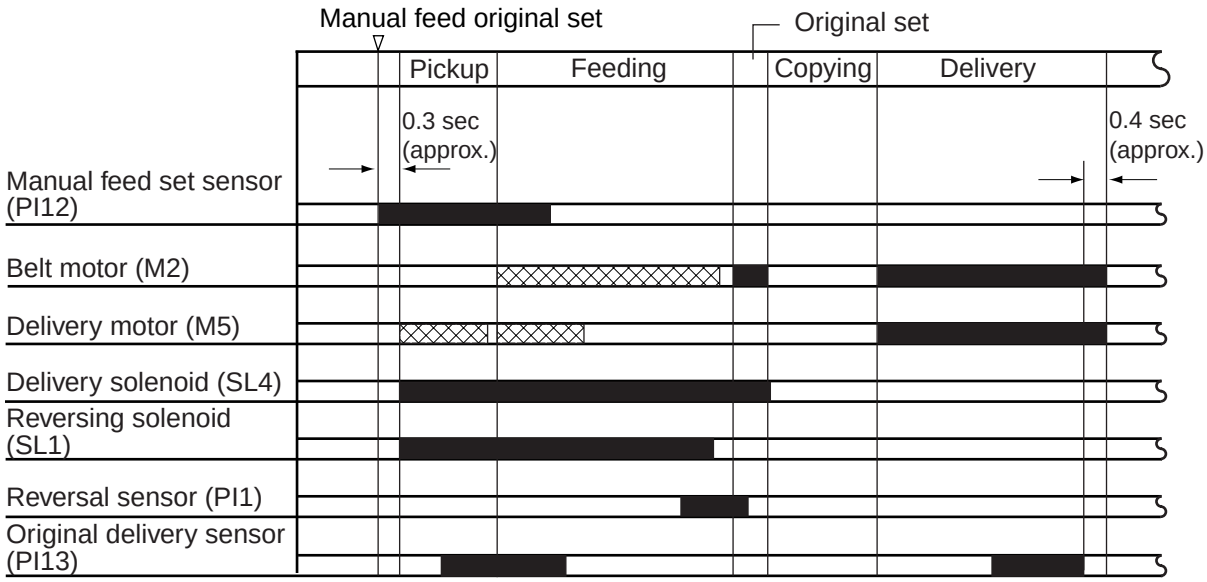

Figure 2-284

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III . DETECTING JAMS

The machine uses the sensors shown in Figure 2-303 to check for original jams. The machine checks for jams at such times as programmed in the CPU on the ADF controller PCB, and a jam is identified in reference to the presence/absence of an original over each appropriate sensor.

When a jam is detected, the machine communicates its presence to the copier. (Some copiers allow checking of such codes in service mode. Or, the indicator (LED2) on the machine's ADF controller PCB may be used to check the code.)

Screen of the Copier's Service Mode

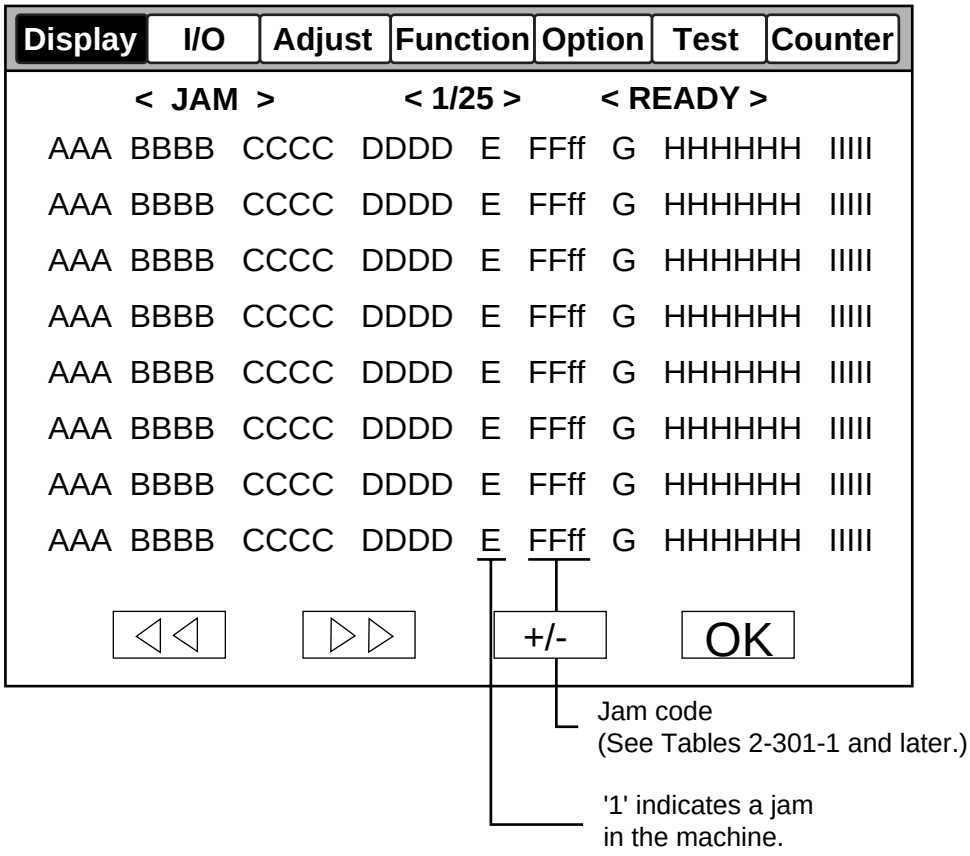

Figure 2-301

Indicator of the Machine

The indicator (LED2) on the ADF controller PCB expresses codes by turning on four times, each time flashing a different segment(s).

EX. Code J-13

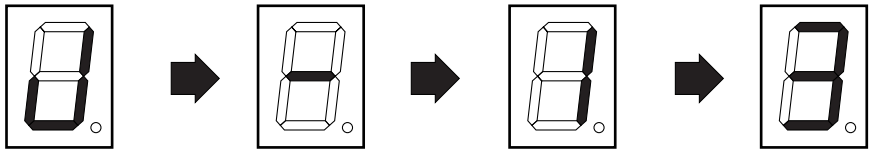

Figure 2-302

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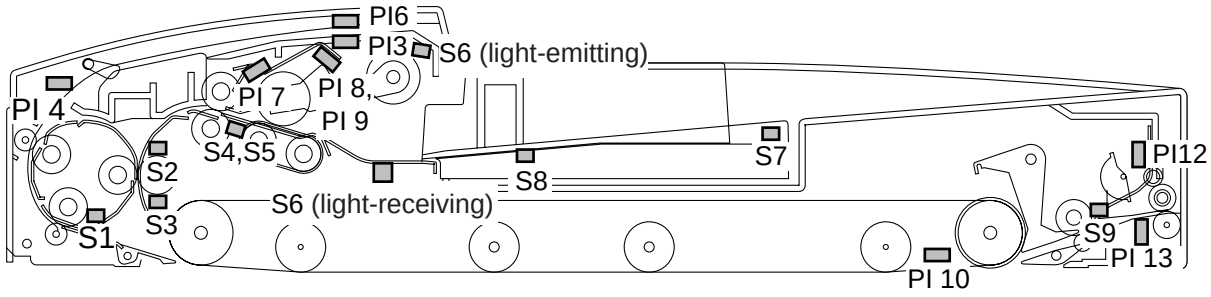

Figure 2-303

Table 2-301-1 shows jam codes, types of jams, associated sensors, and conditions for identification.

Jam code		Jam type	Sensor	Conditions
Machine	Copier			
J-11	0011	Skew after pickup	S4 S5	When picking up an original, the discrepancy in timing between when the separation sensor detected the trailing edge of the original and when the skew sensor detected it was 25 mm or more in terms of feeding length.
J-12	0012	Pickup fault 1	S1	When picking up an original, the reversal sensor detected paper.
J-13	0013	Pickup fault 2	S3	When picking up an original, the reversal sensor detected paper. When picking up an original, the post-registration roller paper sensor detected the original before the reversal motor (M1) started to operate.
			S2	When picking up an original, the pre-registration roller paper sensor did not detect the original after the original had been moved a specific length.
			S3	When performing pre-reversal, the post-registration roller paper sensor detected the original before the reversal motor (M4) started to operate.
			S2	When reversing an original, the pre-registration roller paper sensor did not detect the original after the original had been moved a specific length.
J-14	0014	Reversal delay	S1	When starting to reverse an original, the reversal sensor did not detect the original after the original had been moved a specific length (104 mm).
J-15	0015	Reversal pickup trailing edge skew	S4 S5	When performing pre-reversal, the discrepancy in timing between when the separation sensor detected the trailing edge of the original and when the skew sensor detected it was 10 mm or more in terms of feeding length.

Table 2-301-1

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Jam code		Jam type	Sensor	Conditions
Machine	Copier			
J-16	0016	Reversal pickup fault	PI 4	When reversing an original, the pre-reversal sensor detected the original after moving the original for a specific length.
J-19	0019	Original over sensor	S1	Before picking up an original, the reversal sensor detected an original when the belt motor had been operated for a specific time.
J-22	0022	Separation delay	S4	When performing separation, the separation sensor did not detect an original when the original had been moved for a specific distance (171 mm). (2nd and subsequent sheets)
J-23	0023	Pickup delay	S4 S2	When performing separation, the pre-registration roller did not detect an original even though the separation sensor had detected the leading edge of an original and the original had been moved for a specific length (about 93 mm).
J-24	0024	Pickup leading edge skew	S4 S5	When performing separation, the discrepancy in timing between when the separation sensor detected the leading edge of an original and the skew sensor detected it was 25 mm or more in terms of feeding length.
J-25	0025	Pre-reversal delay	S3	When performing pre-reversal, the post-registration roller sensor did not detect an original after the reversal motor (M1) had been operated for 50 mm in terms of feeding length.
			S3 S1	When performing pre-reversal, the reversal sensor does not detect an original after the post-registration roller paper sensor had detected the leading edge of an original and the original had been fed for a specific length (100 mm).
			PI 4	While performing pre-reversal, the pre-reversal sensor did not detect an original after the reversal motor (M1) had been stopped.
J-31	0031	Pickup stationary	S3	When picking up an original, the post-registration sensor did not detect paper after the reversal motor had been operated for 40 mm in terms of feeding length.
			S2	When picking up an original, the pre-registration roller paper sensor still detected an original after the reversal motor (M1) has been driven and the original had been moved for a specific length (330 mm for small; 660 mm for large).

Table 2-301-2

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Jam code		Jam type	Sensor	Conditions
Machine	Copier			
J-33	0033	Pre-reversal stationary	S1 S4	When performing pre-reversal, the separation sensor still detected an original after the reversal sensor had detected the leading edge of an original and the original had been moved for a specific length (169 mm).
			S2 S4	When performing pre-reversal, the pre-registration sensor still detected an original after the trailing edge of an original had moved past the separation sensor and the original had been moved for a specific length (about 120 mm).
			S2 S3	When performing pre-reversal, the post-registration roller still detected an original after the trailing edge of an original had moved past the pre-registration roller sensor and the original had been moved for a specific length (about 50 mm).
			S1 S3	When performing pre-reversal, the reversal sensor detected an original after the trailing edge of an original had moved past the post-registration sensor and the original had been moved for a specific length (about 100 mm).
J-41	0041	Reversal stationary	S1	When performing reversal, the reversal sensor detected an original after an original had been arched and moved for a specific length (original length × 1.5; approx.).
J-52	0052	Reversal pickup delay	S2	When performing reversal, the pre-registration roller sensor did not detect an original after an original had been arched (over S1) and had been moved for a specific length (about 197 mm).
J-54	0054	Reversal pickup stationary	S3	When performing reversal, the pre-registration roller paper sensor detected an original after pre-registration roller paper sensor had detected the leading edge of an original and the original had been moved for a specific length (original length × 1.5; approx.).
J-55	0055	Pre-reversal pickup delay	S1	When performing pre-reversal, the reversal sensor did not detect an original after the reversal motor had been operated for 100 mm in terms of feeding length.

Table 2-301-3

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Jam code		Jam type	Sensor	Conditions
Machine	Copier			
J-56	0056	Pre-reversal pickup paper stationary	S1 PI 4	When performing pre-reversal pickup, the pre-reversal sensor detected the original after the pre-reversal sensor had detected the leading edge of an original and the original had been moved for a specific length.
			S1 PI 4	When performing pre-reversal pickup, the reversal sensor still detected an original after the pre-reversal sensor had detected the trailing edge of an original and the original had been moved for a specific length.
J-81	0081	Delivery delay	PI 13	When delivering an original, the original delivery sensor did not detect an original after the belt motor had been operated for a specific length.
J-82	0082	Delivery stationary 1	PI 13 S9	When delivering an original, the manual feed registration roller paper sensor still detected an original after the original delivery sensor had detected the leading edge of an original and the original had been moved for a specific distance (original length + 100 mm).
J-83	0083	Delivery stationary 2	S9 PI 13	When delivering an original, the original delivery sensor still detected an original after the trailing edge of an original had moved past the manual feed registration roller paper sensor and had been moved 100 mm.
J-92	0092	Manual feed registration delay	S9	When arching an original in manual pickup, the manual registration sensor did not detect an original 1 sec after the delivery motor was started.
J-A1	00A1	Manual feed registration stationary	S1	When performing manual feed pickup, the reversal sensor does not detect an original after the belt motor had been started and the original had been moved 730 mm.
J-A2	00A2	Manual feed reversal stationary	S1	When performing manual feed pickup, the reversal sensor still detected an original after an original had reached the reversal sensor and the belt motor was driven for about 50 mm.
J-A3	00A3	Manual feed delivery delay	PI 13	When performing manual feed delivery, the original delivery sensor did not detect an original after an original had been moved for a specific distance (621 mm - original length).
J-A4	00A4	Manual feed delivery stationary	PI 13	When performing manual feed delivery, the original delivery sensor still detected an original after the original delivery sensor had detected the leading edge of an original and the original had been moved for a specific length (original length × 1.5).

Table 2-301-4

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Jam code		Jam type	Sensor	Conditions
Machine	Copier			
J-A5	00A5	Manual feed residual original	S1 S9	When performing manual feed pickup, the reversal sensor detected an original before the trailing edge of an original had moved past the manual feed registration sensor.
J-A6	00A6	Manual feed original size error	S9 S1	When performing manual feed pickup, the reversal sensor detected an original while the manual feed registration roller paper sensor detected an original.
J-E1	00E1	ADF open	PI 10	The ADF was opened.
J-E2	00E2	Left cover open	PI 3 PI 6	The left cover was open.
J-E3	00E3	Circulation error	S6	The pickup signal was received from the copier before an original had been detected.
J-E4	00E4	Initial error	PI 4 PI 12 PI 13 S1 S2 S3 S4 S5 S9	When starting an operation, an original exists in the path.
J-E6	00E6	Original size error	S3	In stream reading mode (LDR), the post-registration roller paper sensor detected an original after an original had been moved 30 mm from its wait position.
J-E7	00E7	User ADF open	PI 10	The ADF was opened in operation.
J-E8	00E8	User left cover open	PI 3 PI 6	The left cover was opened in operation.
J-E9	00E9	Power down		The voltage of power supplied by the copier fluctuated in operation.
J-EA	00EA	Stream reading image leading edge position error	PI 5 S7	In stream reading mode, a large-size original was picked up despite instructions for a small-size original for stream reading.
			PI 5 S7	In fixed reading mode, a large-size original was detected after pickup although a small-size original was detected at time of starting operation.
J-F3	00F3	Belt status	PI 1	When switching the states of the belt motor, the belt motor is not in acceleration, constant speed, or deceleration mode.

Table 2-301-5

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Jam code		Jam type	Sensor	Conditions
Machine	Copier			
J-F4	00F4	Image leading edge output timing error	S2 S3 SW301	In stream reading mode, the image leading edge signal is generated while an original is accelerated from its wait position to the image leading edge position.
J-FD	00FD	Last sheet error	PI 1	The last sheet is not moved properly by the feeding belt.
J-FE	00FE	Error	PI 1 PI 2 PI 11	A jam related to the motor drive system has occurred less than three times.

Table 2-301-6

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IV . POWER SUPPLY

Figure 2-401 is a diagram of the machine's power supply system.

The machine is supplied with two channels of 24 V power: one (J4-1 input) is sent to loads through a fuse (FU1), while the other (J1-6 input) is sent to sensors and the ADF controller PCB after conversion by a regulator (Q28) to 5 V power.

The fuse (FU1) is used to cut the line to protect the circuit in response to overcurrent.

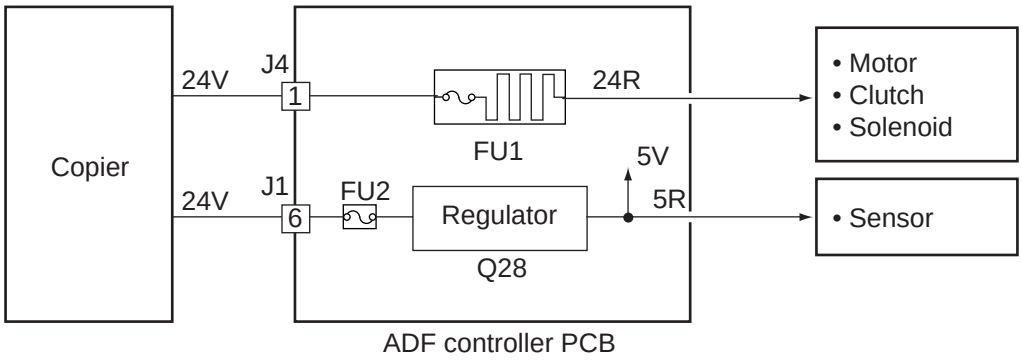

Figure 2-401

CHAPTER 3

MECHANICAL SYSTEM

The mechanical characteristics of the ADF are discussed in the following pages; go through the instructions given when disassembling/assembling the finisher's parts while keeping the following in mind:

1. ⚠ Disconnect the power plug before disassembly/assembly work.
2. Assemble the parts by reversing the steps used to disassemble them, unless otherwise noted.
3. Identify the screws by type (length, diameter) and location.
4. Do not leave out the washer that comes with the screw used for the grounding wire and the varistor to ensure electrical continuity.
5. Do not operate the machine with any of its parts removed, unless otherwise mentioned.

I . BASIC CONSTRUCTION 3-1
A. External Covers 3-1
II . DRIVE SYSTEM 3-7
III . FEEDING SYSTEM 3-12
IV . REPLACING THE FEEDING BELT 3-30

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I . BASIC CONSTRUCTION

A. External Covers

[1] Lower front cover
[2] Front cover
[3] Main cover
[4] Original tray
[5] Upper cover
[6] ADF controller cover

Remove the covers as follows when cleaning, inspecting, or repairing the inside of the machine.

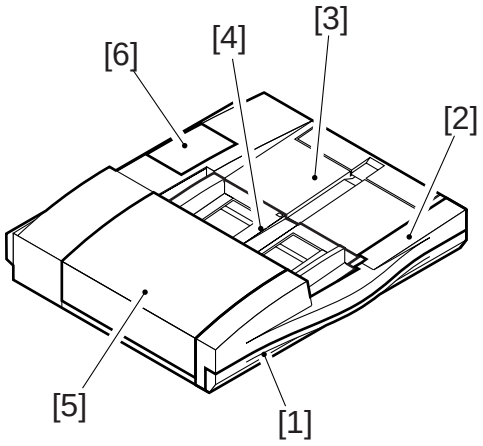

Figure 3-101

1. Removing the Machine

1) Turn off the copier.
2) Disconnect the communication cable [1] of the machine from the copier.

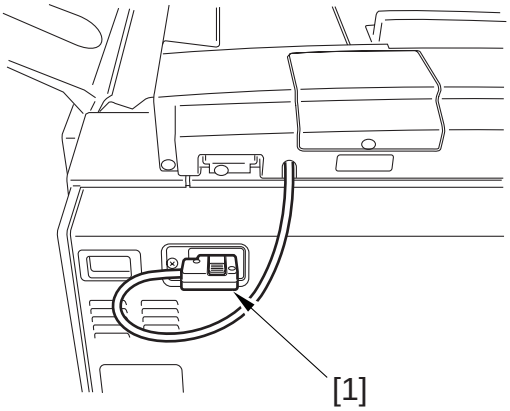

Figure 3-102

3) Open the machine fully.
4) Go to the rear of the copier, and lift the machine to remove.

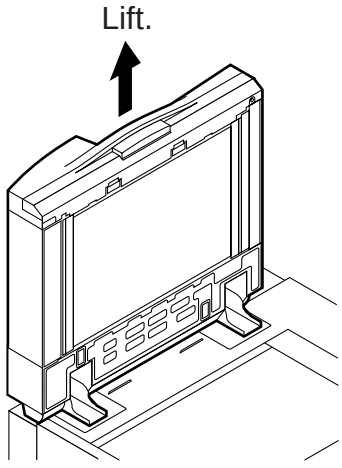

Figure 3-103

Reference:

The hinge support is equipped with a locking mechanism to prevent displacement, requiring you to fully open it when removing it from the copier.

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2. Removing the Lower Front Cover

1) Remove the two screws [1], and slide the lower front cover [2] to the front to remove.

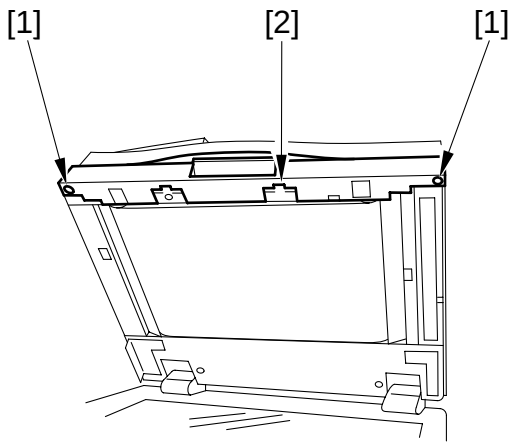

Figure 3-104a

3. Removing the Front Cover

1) Remove the four screws [1], and slide the front cover [2] to the front to remove.

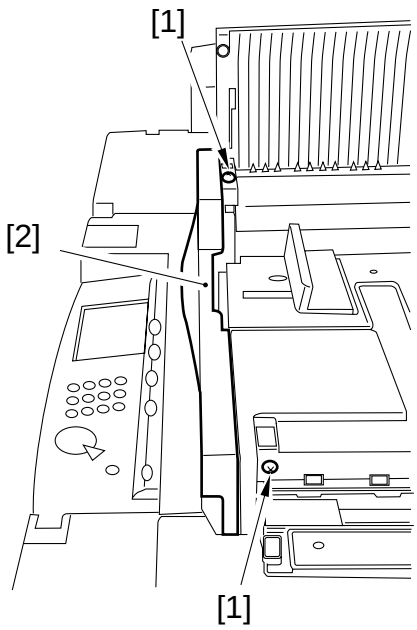

Figure 3-104b

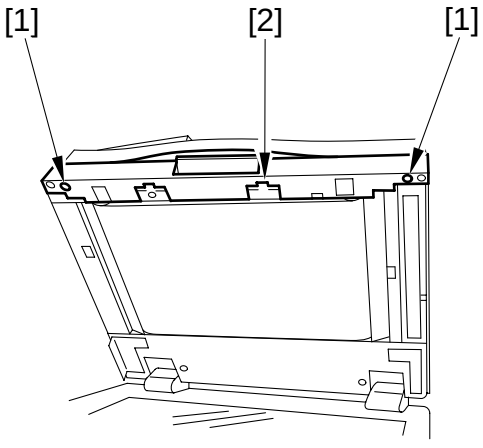

Figure 3-104c

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4. Removing the Main Cover

1) Free the hook of the pickup assembly cover [1] from the right stay; then, detach it while paying attention to the hooks on the front and rear side plates.

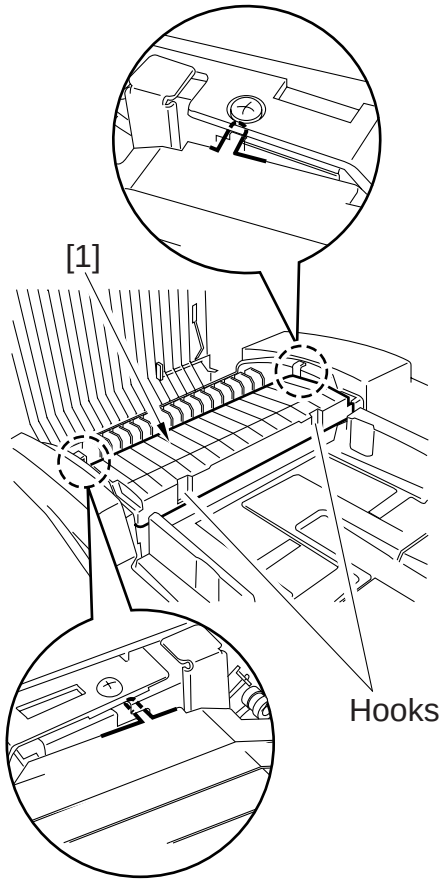

Figure 3-105a

2) After removing the ADF controller cover, disconnect the connector [2], and remove the screw [3]; then, detach the grounding wire [4].
Free the harness from the wire saddle [5], and remove the other wire saddle [6].

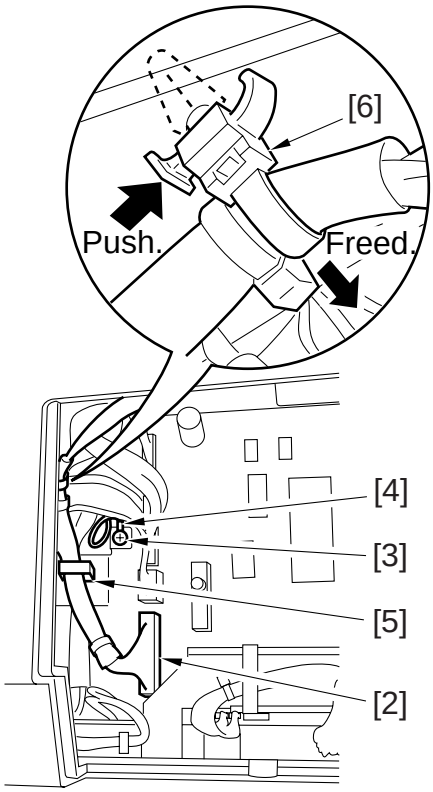

Figure 3-105b

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3) Remove the four screws [7], and detach the main cover [8].

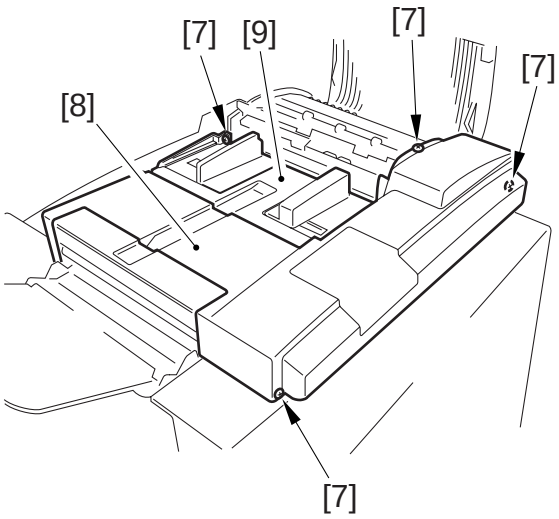

Figure 3-106

Caution:
The main cover has the original tray [9] attached to it. Be sure to take good care not to damage the cable when detaching it.

5. Removing the Original Tray

1) Move the side guide (front, [1]; rear, [2]) to the inside; then, remove the two screws [3], and detach it.

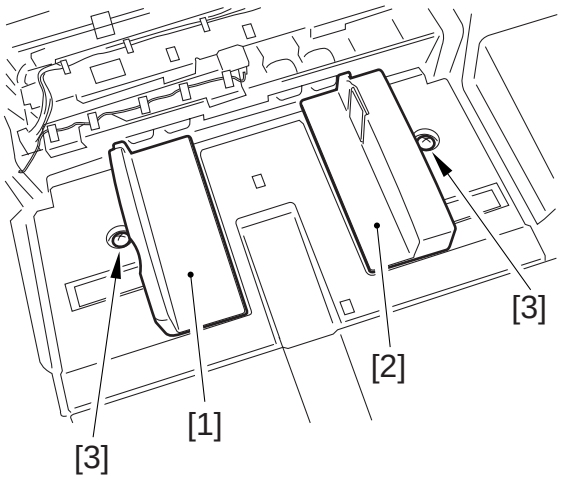

Figure 3-107

Caution:
After mounting, be sure to perform horizontal registration adjustment.

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6. Removing the Upper Cover

1) Remove the front cover, and remove the screw [1]; then, remove the positioning pin [2] from the pickup front side plate.
2) Remove the stepped screws used to secure the pickup side plate (front, rear) and the link arm [4] of the upper cover [3] in place; then, detach the upper cover [3].

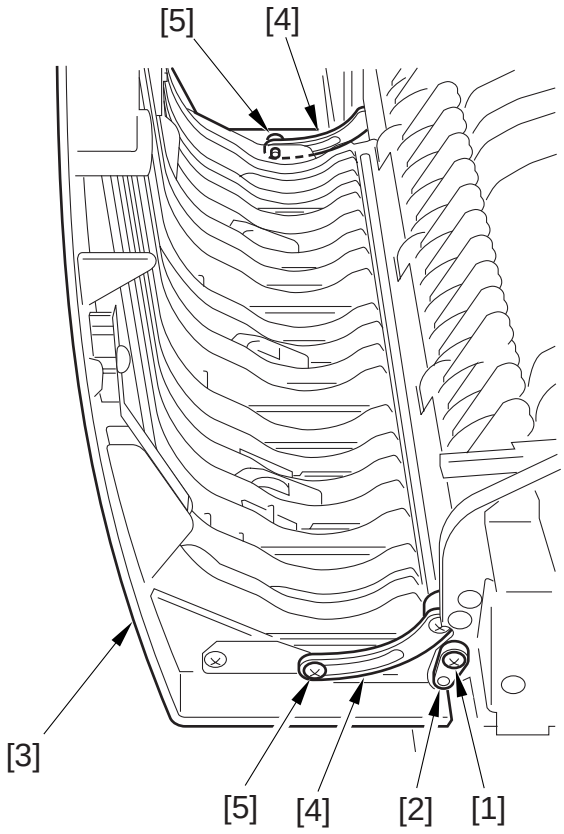

Figure 3-108

7. Removing the ADF Controller Cover

1) Remove the screw [1], and detach the ADF controller cover [2].

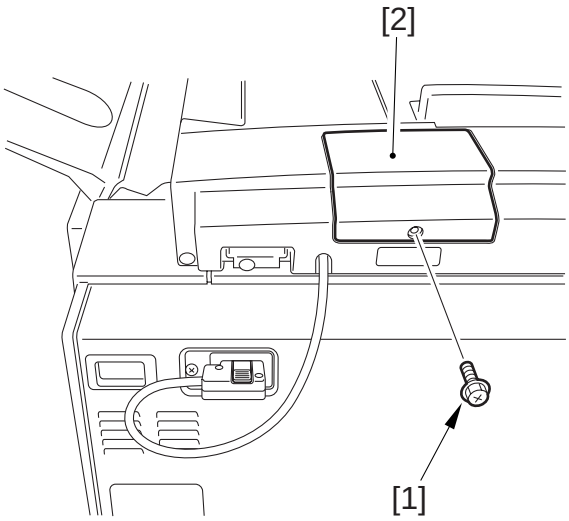

Figure 3-109

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8. Side Guide Lock

1) The side guide of the original tray is equipped with a side guide lock [1] (fitted to the groove of the original tray).

Caution:
When the lock is fitted, the tray supports A3/A4 paper; when removed, the tray will support paper as wide as 305 mm.

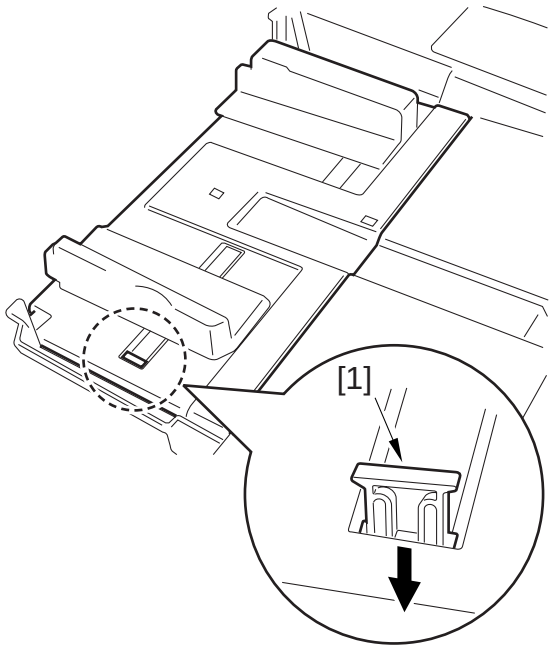

Figure 3-110

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II . DRIVE SYSTEM

1. Removing the Reversal Motor Unit

1) Disconnect the connector [2] (J602) from the reversal motor driver PCB [1].
2) Remove the screw [3], and detach the pre-reversal sensor mount [4].

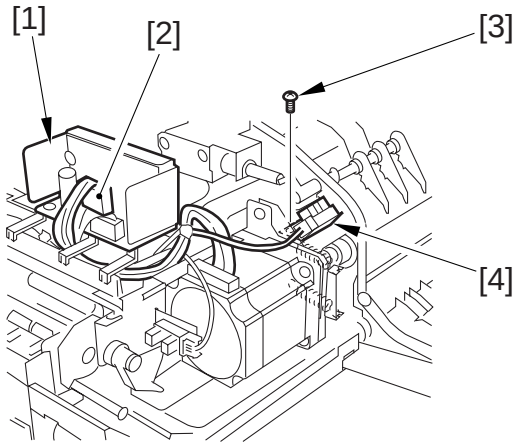

Figure 3-201

3) Remove the screw [5], and detach the cover [6]; then, remove the two screws [7], and detach the reversal motor unit [8].

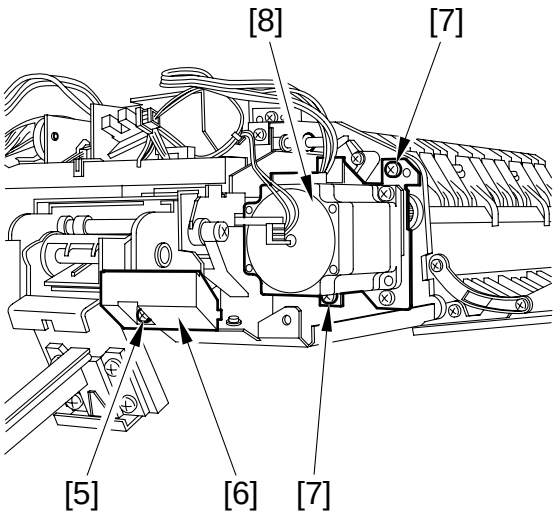

Figure 3-202

2. Removing the Separation Motor Unit

1) Remove the screw [1], and detach the separation motor sensor support plate [2].

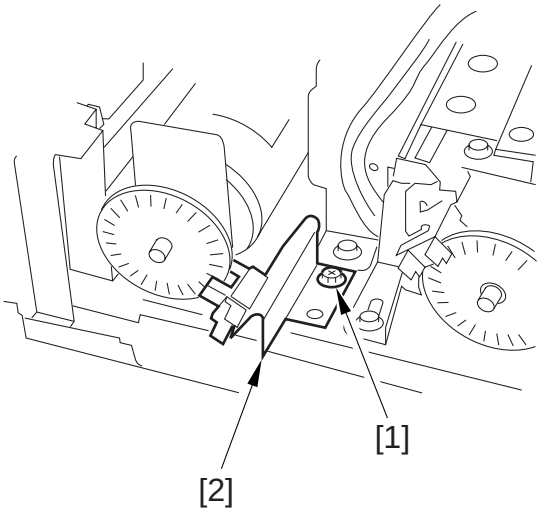

Figure 3-203

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2) Disconnect the two connectors [3].

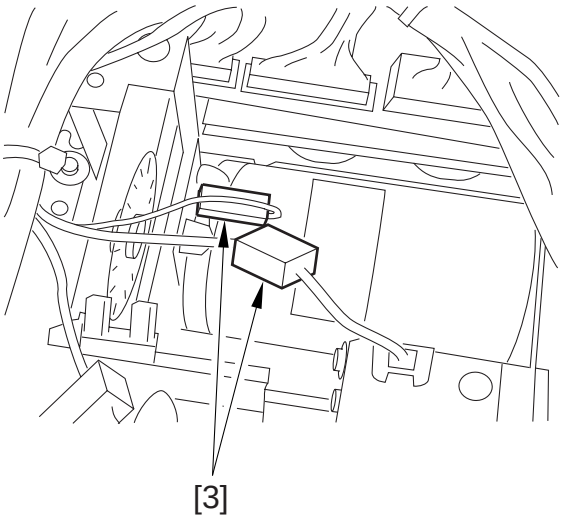

Figure 3-204

3) Remove the three mounting screws [4], and detach the separation motor unit [5].

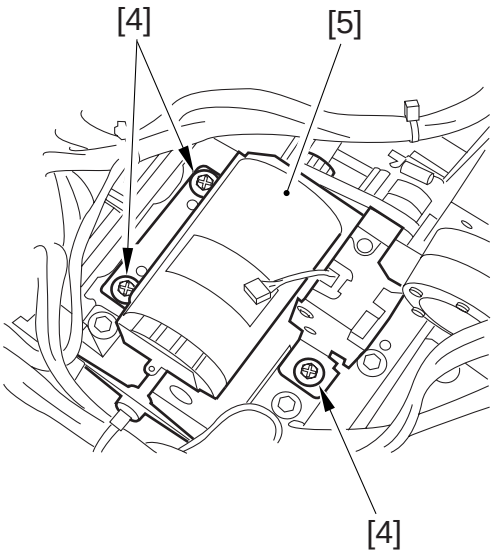

Figure 3-205

3. Removing the Pickup Motor Unit

1) Remove the separation motor unit.
2) Remove the two screws [1], and detach the belt motor driver PCB unit [2].

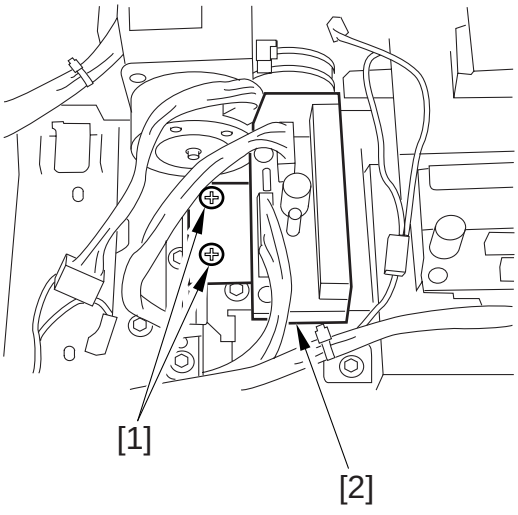

Figure 3-206

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3) Disconnect the connector [4] of the pickup motor unit [3] and the connector [6] of the open/closed sensor (rear) [5].

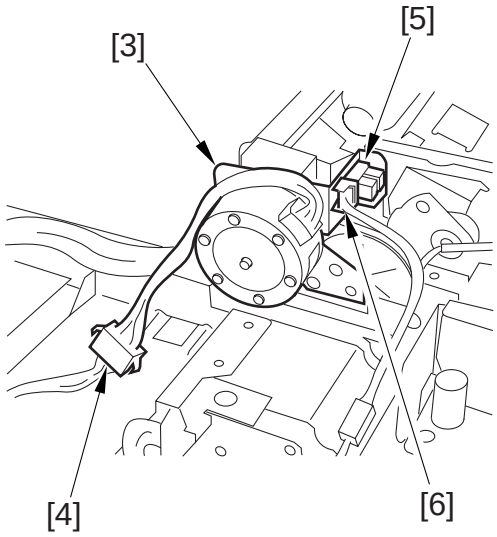

Figure 3-207

4) Remove the two mounting screws [7], and detach the pickup motor unit [3].

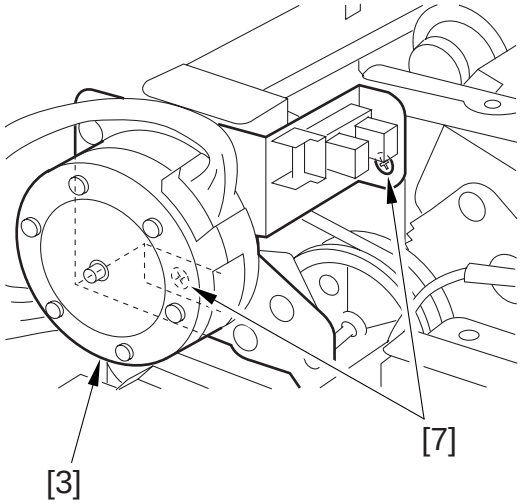

Figure 3-208

4. Removing the Belt Motor Unit

1) Remove the separation motor unit and the pickup motor unit.
2) Disconnect the connector [2] (J72) of the belt motor driver PCB [1].

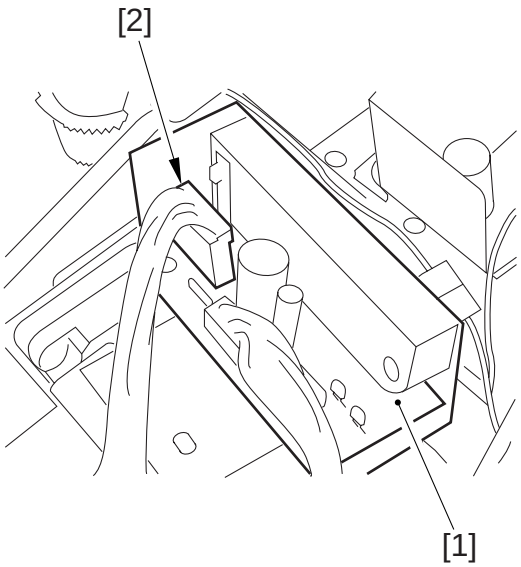

Figure 3-209

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3) Remove the three screws [3], and detach the belt motor unit [4].

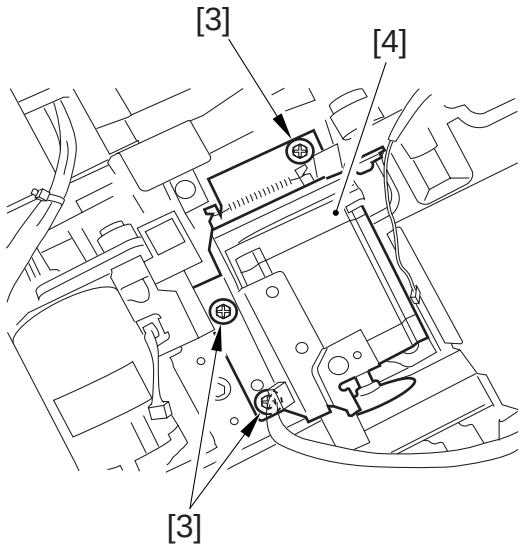

Figure 3-210

5. Removing the Delivery Motor

1) Remove the main cover.
2) Remove the screw [1] of the bottom of the machine, and remove the bearing [2] and the rod [3].

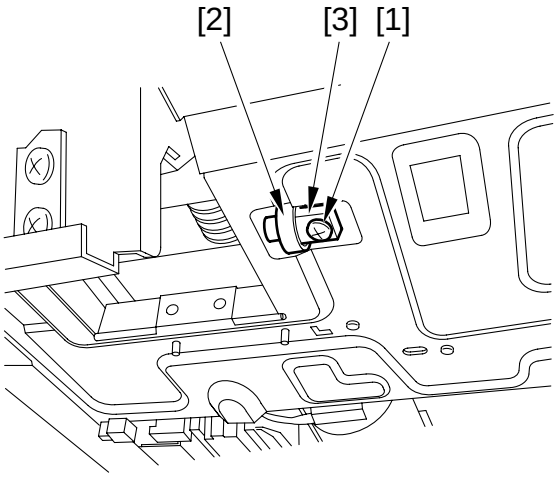

Figure 3-211

3) Remove the four screws [4], and remove the hinge (right) [5].

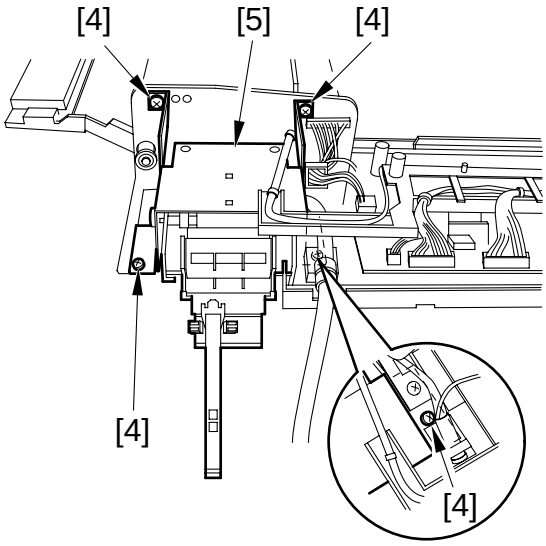

Figure 3-212

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4) Remove the screw [6], and detach the delivery motor sensor [7].

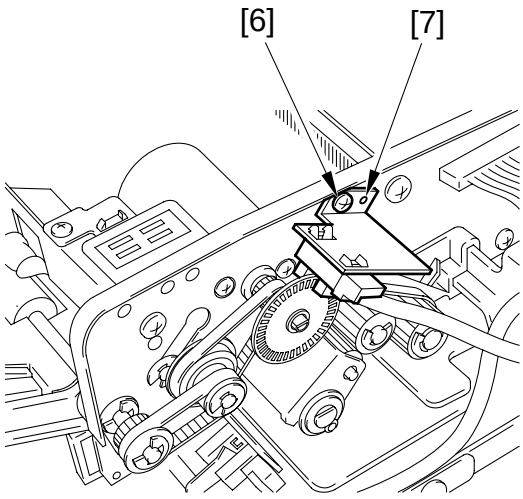

Figure 3-213

5) Remove the grip ring [8], and detach the clock plate [9].
6) Remove the E-ring [10], and remove the belt retaining washer [11] and the gear [12].
7) Remove the screw [13], and detach the delivery motor [14].

Caution:
If you have replaced the delivery motor, be sure to adjust the sensor and the delivery motor.

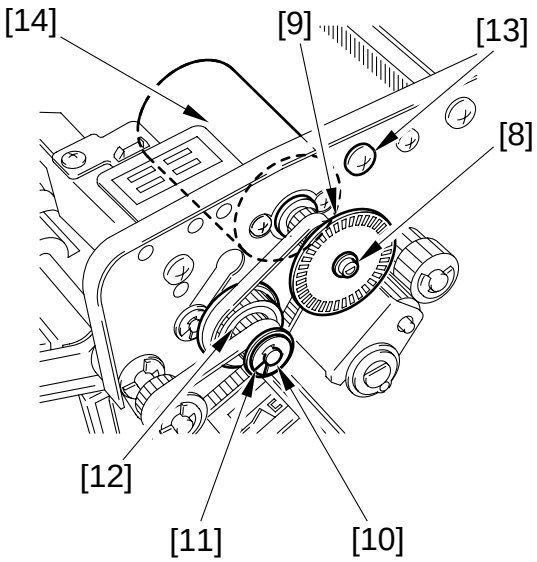

Figure 3-214

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III . FEEDING SYSTEM

1. Removing the Delivery Roller

1) Remove the front cover. (Figures 3-104b, 3-104c)
2) Remove the main cover. (Figures 3-105a, 3 -105b)
3) Remove the E-ring [1], and remove the solenoid link arm [2].

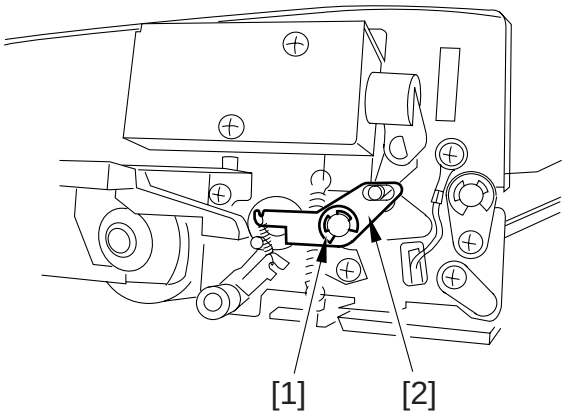

Figure 3-301

4) Remove the screw [3], and detach the delivery guide plate [4].
5) Remove the screw [5], and detach the grounding wire [6] of the static eliminator mounted to the delivery guide.

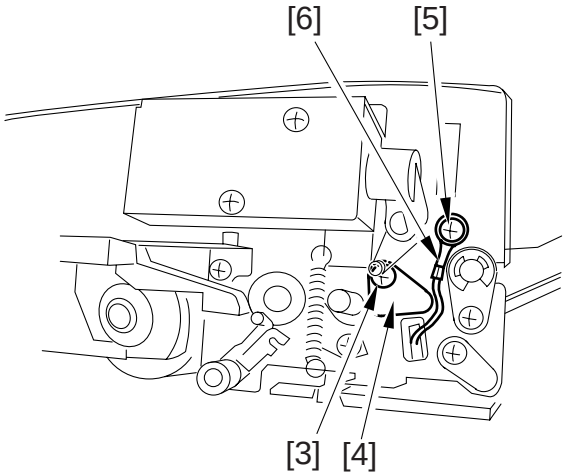

Figure 3-302a

6) Remove the three screws [7], and disconnect the connector [8]; then, detach the solenoid unit [9] of the delivery assembly front side plate.

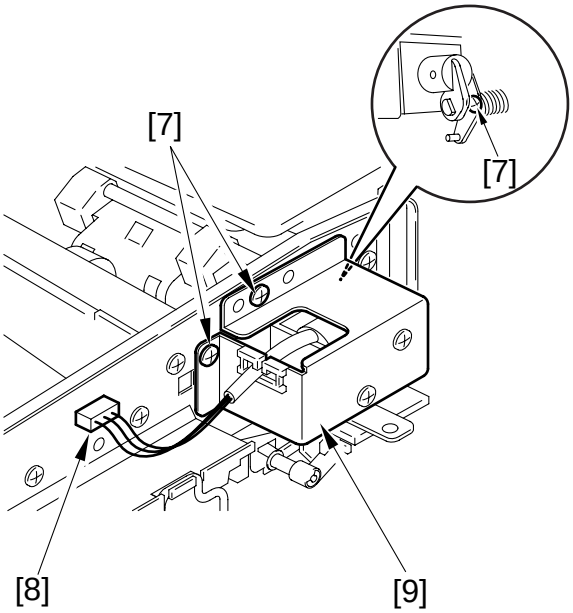

Figure 3-302b

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7) Remove the screw [10], and detach the delivery sensor support plate [11] on the delivery assembly rear side plate side.

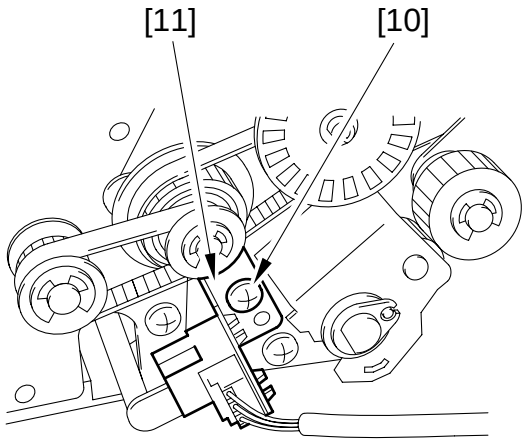

Figure 3-303

8) Remove the screw [12], and detach the delivery guide support plate [13] on the delivery assembly rear side plate side.

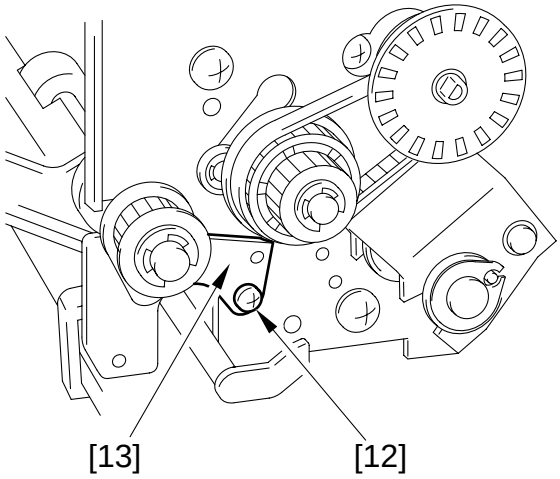

Figure 3-304

9) Remove the screw [14], and detach the delivery lower guide support plate [15].
10) Remove the E-ring [16] of the delivery assembly front side plate side; then, remove the screw [17], and detach the bushing [18].

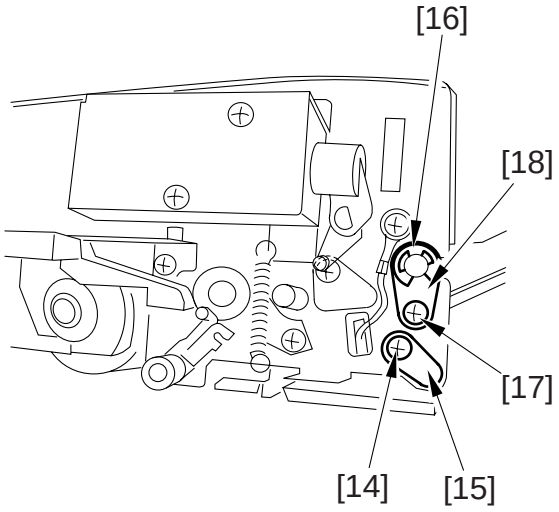

Figure 3-305

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11) Remove the E-ring [19] from the delivery assembly rear side plate side; then, remove the gear [20] and the parallel pin [21].
12) Remove the E-ring [22], and remove the screw [23]; then, detach the bushing [24].

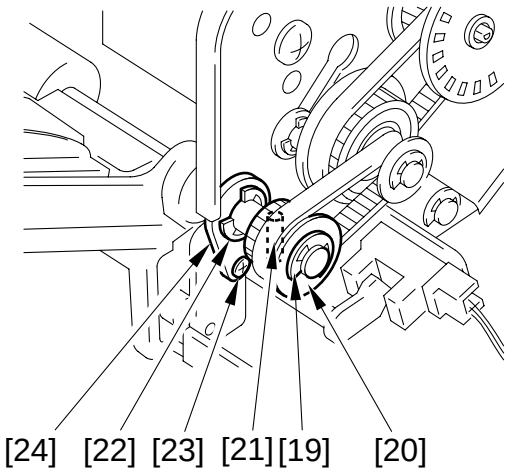


Figure 3-306

13) Slide down the delivery lower guide [25]; then, slide out the delivery roller [26] together with the manual feed tray [27].

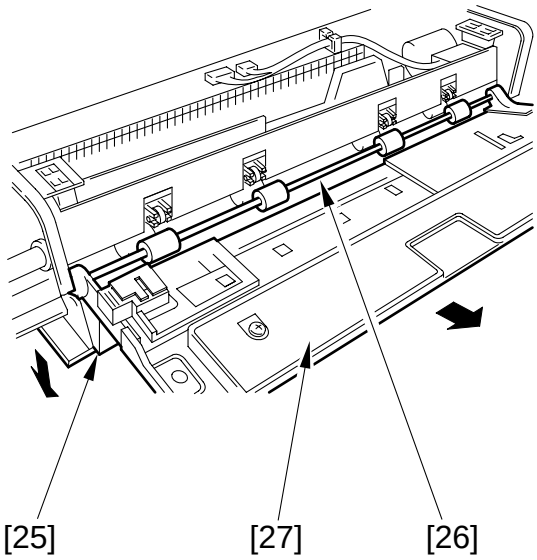
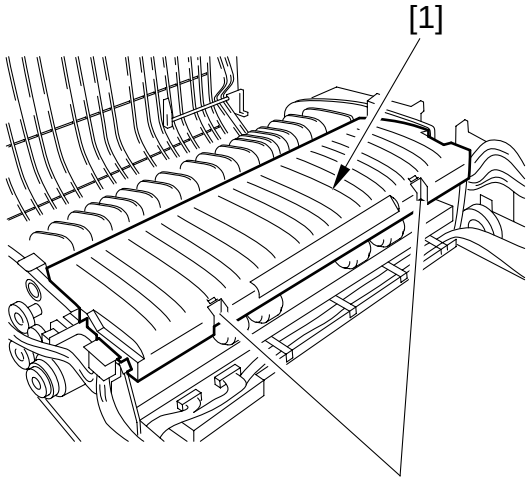


Figure 3-307

2. Removing the Pickup Roller

1) Remove the pickup assembly cover [1].



Free the claws, and detach the cover

Figure 3-308a

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2) Remove the resin E-ring [2], and remove the roller arm [3]; then, detach the pickup roller [4].

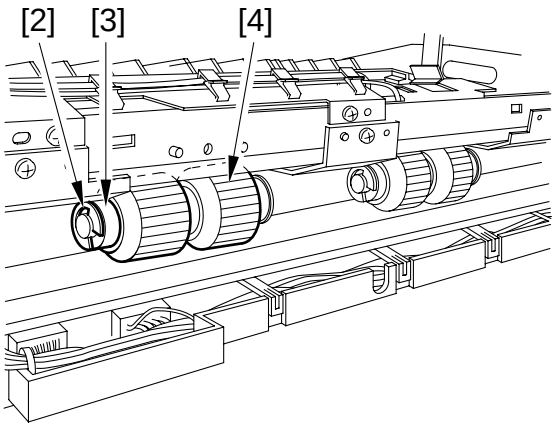

Figure 3-308b

3. Removing the Separation Roller

1) Remove the pickup assembly cover. (Figure 3-308)
2) Remove the two screws [1], and detach the sensor stay [2].
3) Remove the three screws [3], and detach the guide plate [5] (3 pc.) attached to the right stay [4].

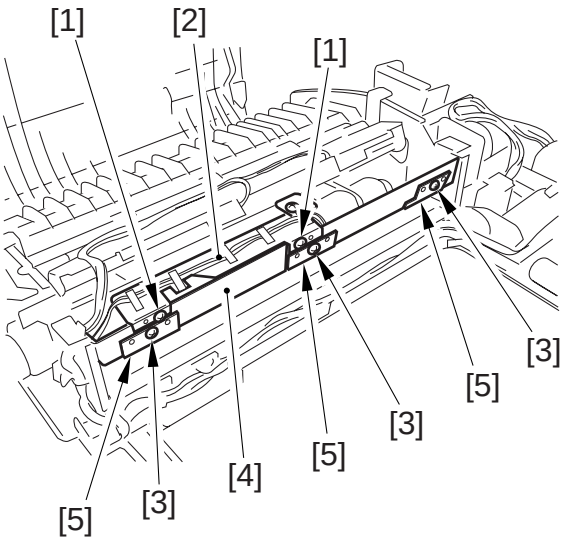

Figure 3-309

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4) Remove the two screws [6], and detach the lower guide [7].

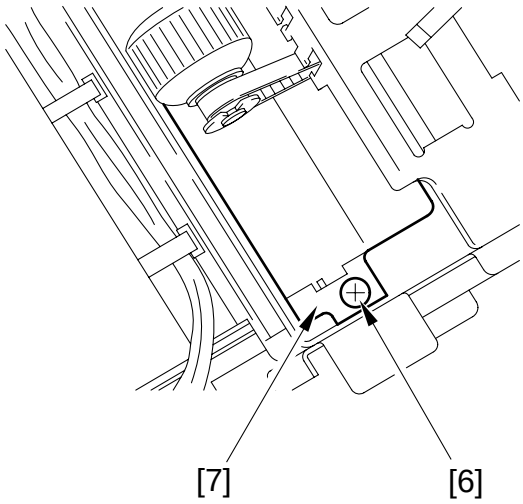

Figure 3-310a

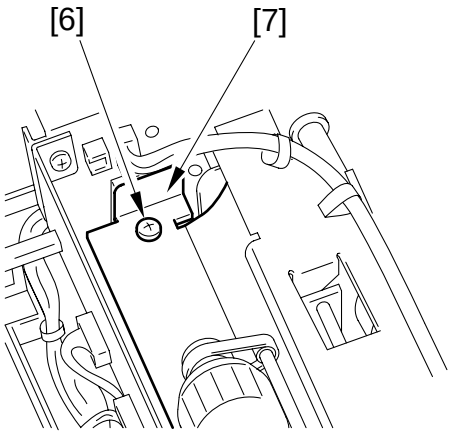

Figure 3-310b

5) Remove the grip ring [8] from the front side plate side, and pull out the clutch ring [9].

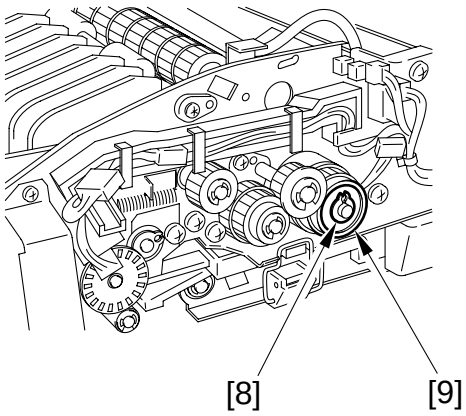

Figure 3-311

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6) Remove the screw [11] from the gear support plate (front) [10]; then, slide the gear support plate (front) [10] to the left, and detach the clutch [12] to the front.

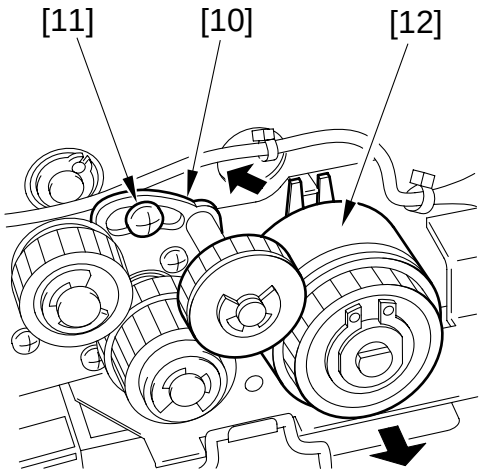

Figure 3-312

7) Disconnect the two connectors [13]; then, remove the two mounting screws [14], and detach the separation unit [15].

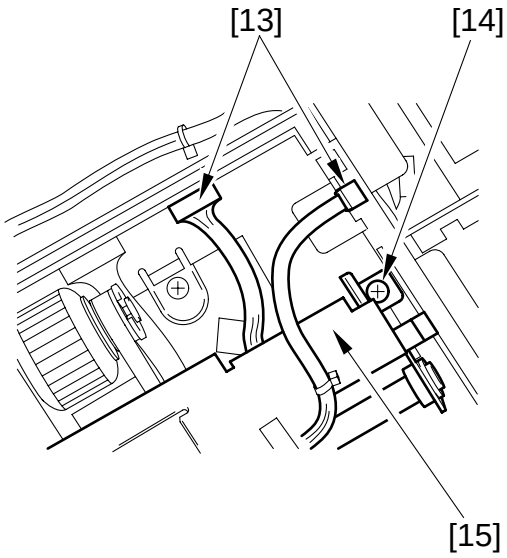

Figure 3-313a

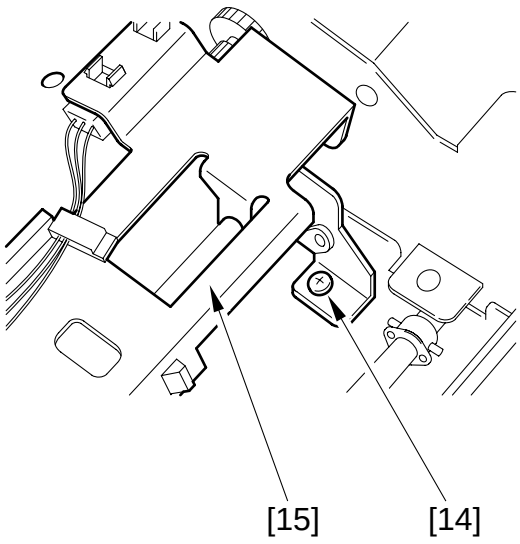

Figure 3-313b

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8) Remove the E-ring [16], and pull out the shaft [17].

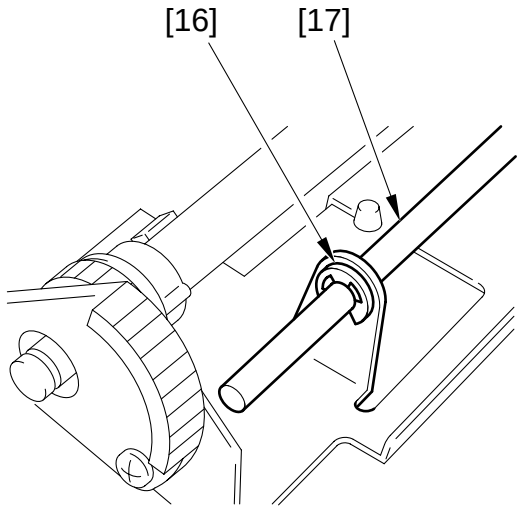

Figure 3-314

9) Remove the grip ring [18] at the front, and detach the bushing [19].

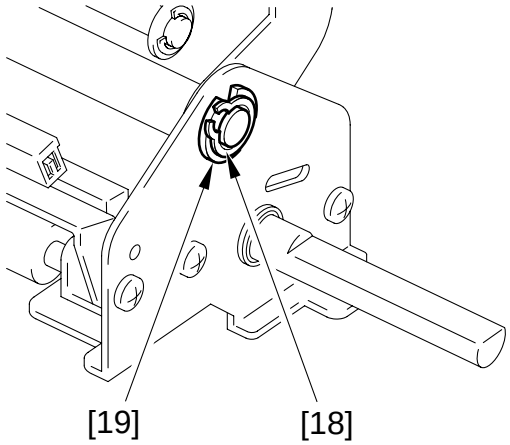

Figure 3-315

10) Remove the E-ring [20] at the rear; then, remove the bushing [21], and detach the rod arm plate [22].

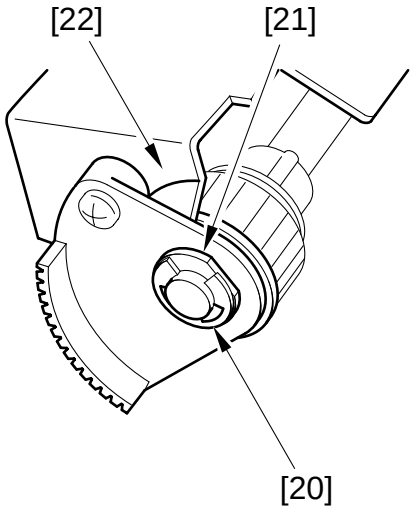

Figure 3-316

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11) Remove the E-ring [23] at the rear, and detach the one-way gear [24].

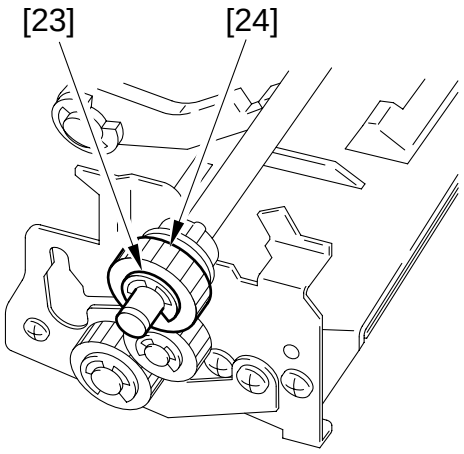

Figure 3-317

12) Remove the separation roller.

Caution:
When mounting the one-way gear, be sure that the protrusion is toward the inside.

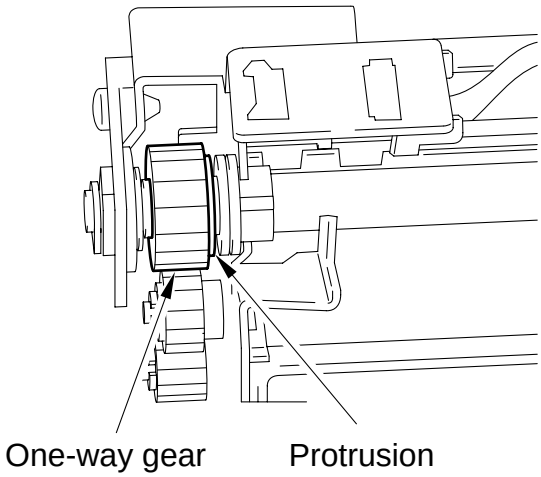

Figure 3-318

4. Removing the Manual Feed Registration Roller

1) Remove the front cover. (Figures 3-104b, 3-104c)
2) Remove the main cover. (Figure 3-105)
3) Remove the three screws [1], and disconnect the connector [2]; then, detach the solenoid unit [3] of the delivery assembly front plate side.

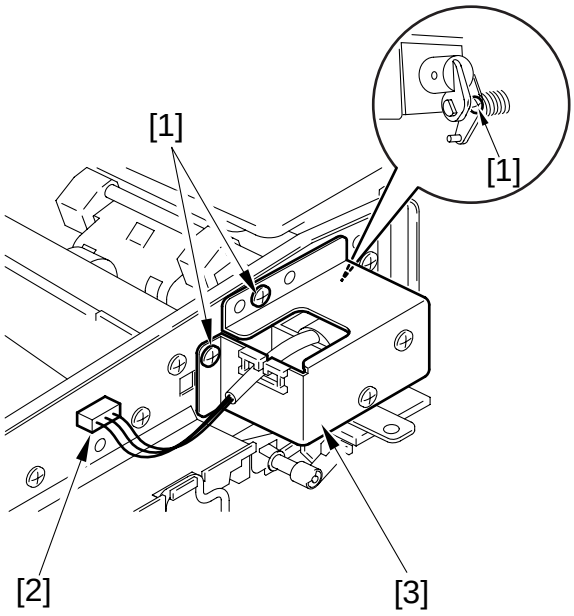

Figure 3-319

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4) Remove the two screws [4], and detach the manual feed registration sensor PCB [5].

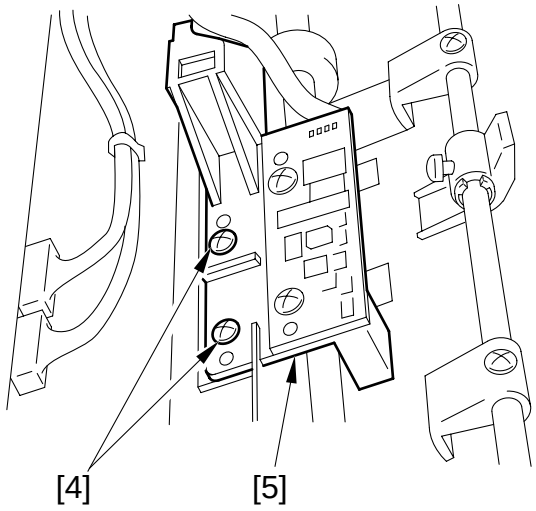

Figure 3-320

5) Remove the grip ring [7] and the bearing [8] from the manual feed registration roller [6]. (delivery assembly front plate side)

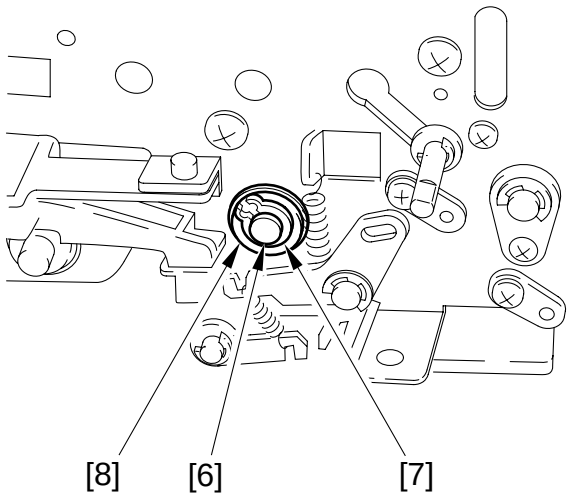

Figure 3-321

6) Remove the grip ring [9] of the manual registration roller [6] and the E-ring [11] of the feeding belt roller shaft [10]; then, remove the parallel pin [13], and detach the gear unit [14] and the bushing [15].

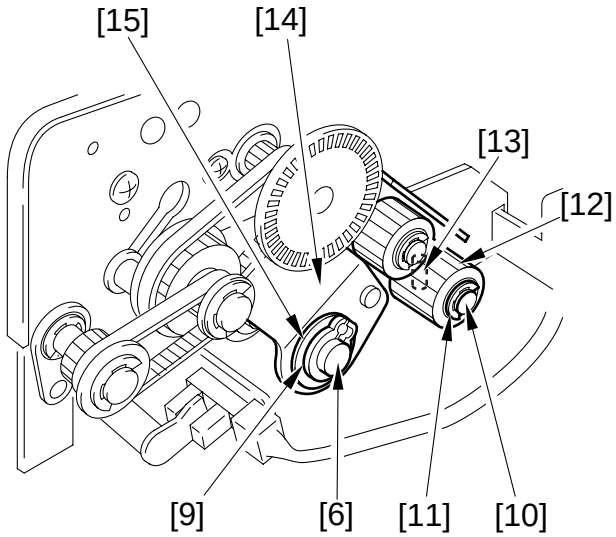

Figure 3-322

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7) Remove the E-ring [14] and the bearing [15] of the manual feed registration roller [6] (delivery assembly rear side plate side); then, pull out the manual feed registration roller [6].

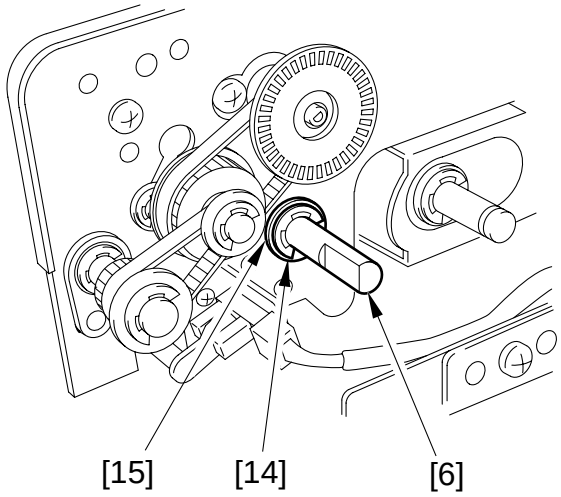

Figure 3-323

5. Removing the Feeding (pull-out) Roller

1) Remove the mounting screw [2] of the gear support plate [1] of the pickup front side plate side.

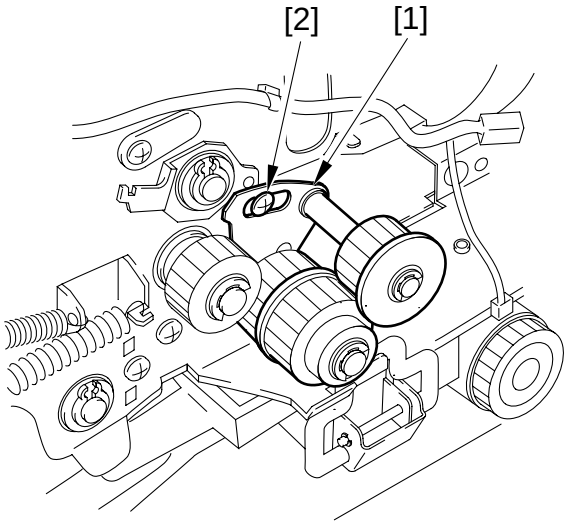

Figure 3-324

2) Remove the E-ring [3], washer [4], shim [5] (2 pc.), gear (black) [6], gear (white) [7], shim [5] (2 pc.), and spring [8] in the order indicated on the pickup front side plate side.

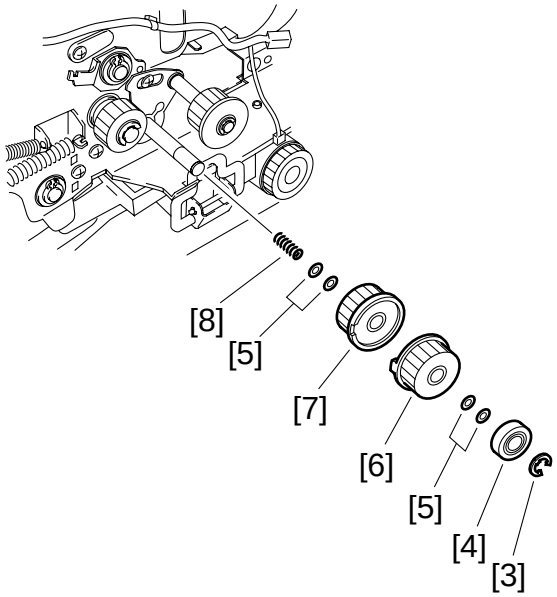

Figure 3-325

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3) Remove the gear support plate of the front side plate side.
4) Remove the E-ring [10], gear [11], parallel pin [12], grip ring [13], and bearing of the feeding (pull-out) roller [9] (front side plate side).

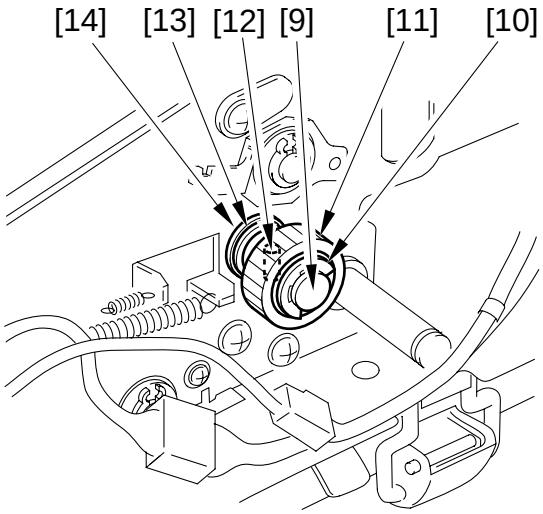

Figure 3-326

5) Remove the E-ring [15], gear [16], parallel pin [17], E-ring [18], and bearing of the feeding (pull-out) roller [9] (rear side plate side); then, detach the feeding (pull-out) roller [9].

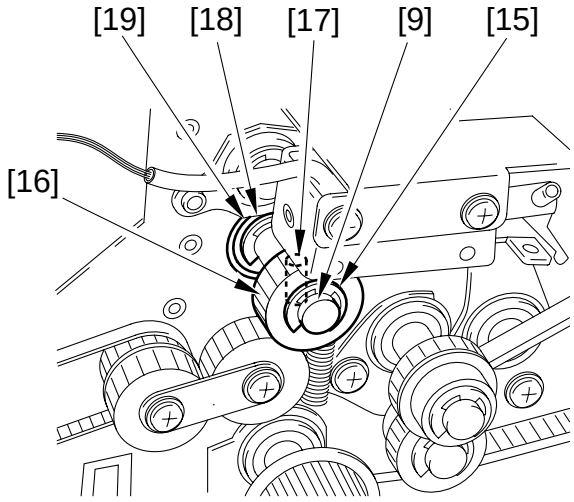

Figure 3-327

Caution:
The gear holds a pin. Take care not to lose it.

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6. Removing the Registration Roller

1) Remove the two screws [1], and detach the reversing guide [2].

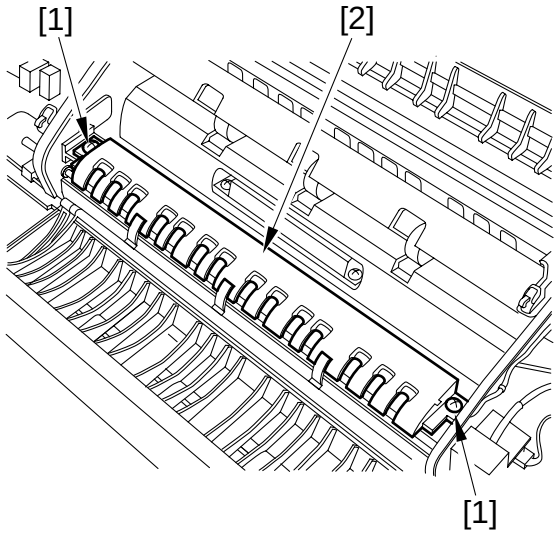

Figure 3-328

2) Remove the two screws [3], and detach the registration sensor PCB [4].

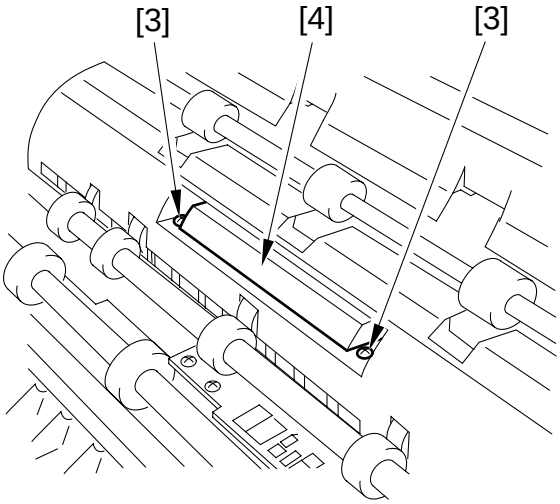

Figure 3-329

Caution:
A cable is connected to the registration sensor. Be sure to disconnect the connector when removing the PCB.

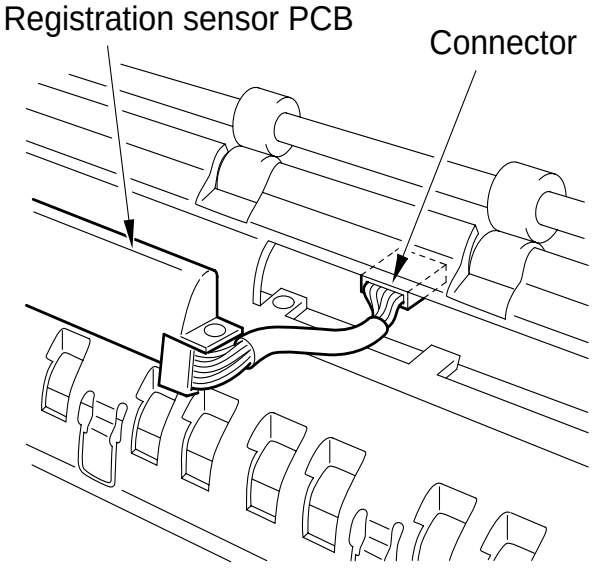

Figure 3-330

3) Remove the grip ring [6] and the bearing [7] of the registration roller [5] (front side plate side).

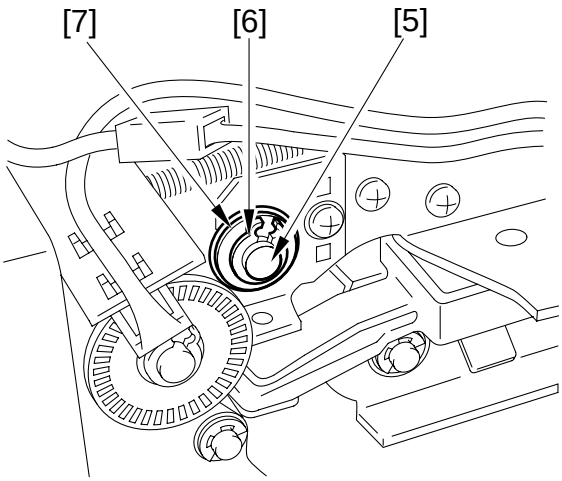

Figure 3-331

4) Remove the E-ring [8], gear [9], E-ring [10], and bearing [11] from the registration roller [5] (rear side plate side).

Caution:
The gear holds a pin. Take care not to lose it when removing the gear.

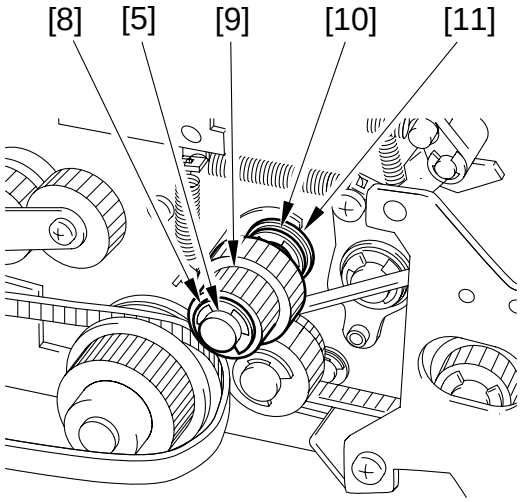

Figure 3-332

7. Removing the Separation Belt

1) Remove the two screws, and loosen the separation unit.
2) Remove the grip ring [1] at the front; then, detach the clutch ring [2] and the clutch [3].

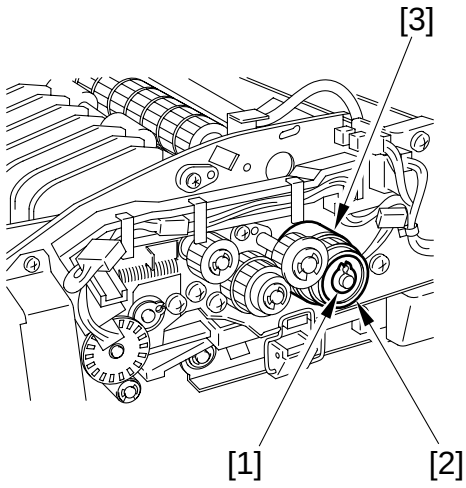

Figure 3-333

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3) Disconnect the two connectors [4], and remove the two mounting screws [5]; then, detach the separation unit [6].

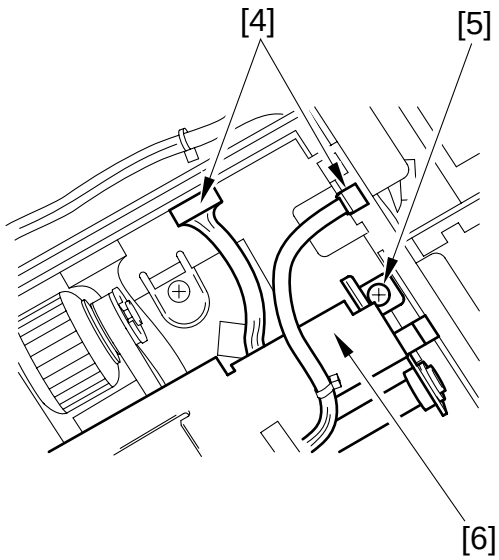

Figure 3-334a

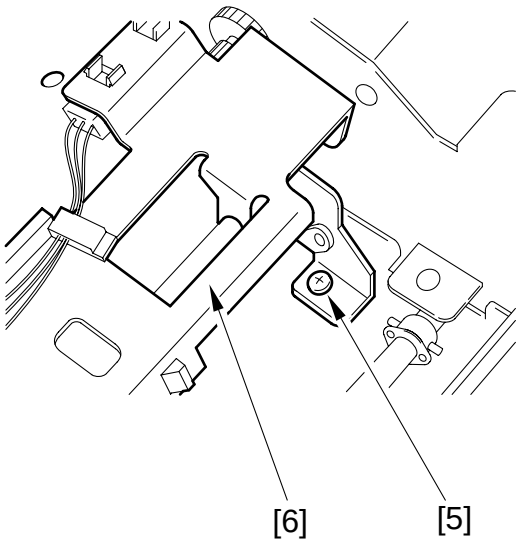

Figure 3-334b

4) Remove the two mounting screws [7], and detach the separation auxiliary plate [8].

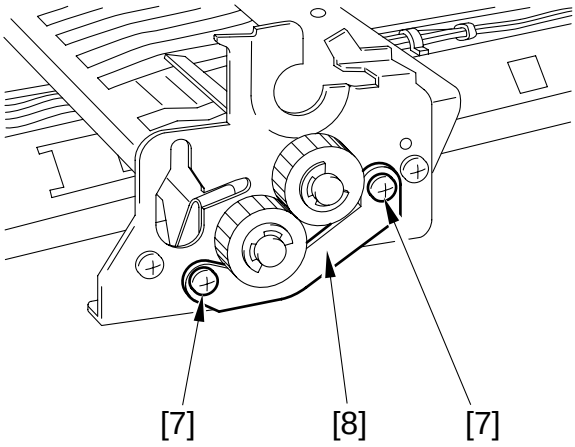

Figure 3-335

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5) Loosen the screw [11] on the separation pressure change lever [10] of the separation roller [9].

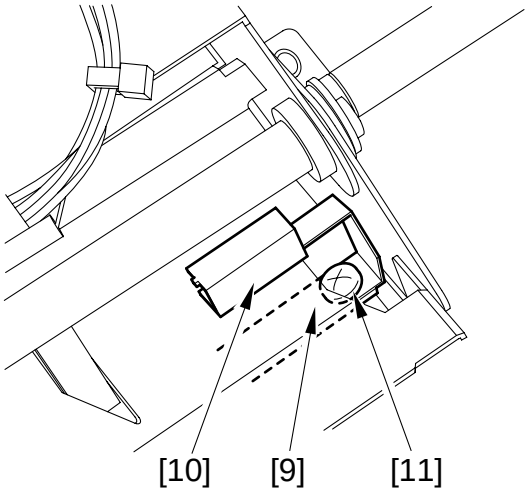

Figure 3-336a

Caution:
When mounting the separation pressure change lever, be sure to set it at 'pressure low.'

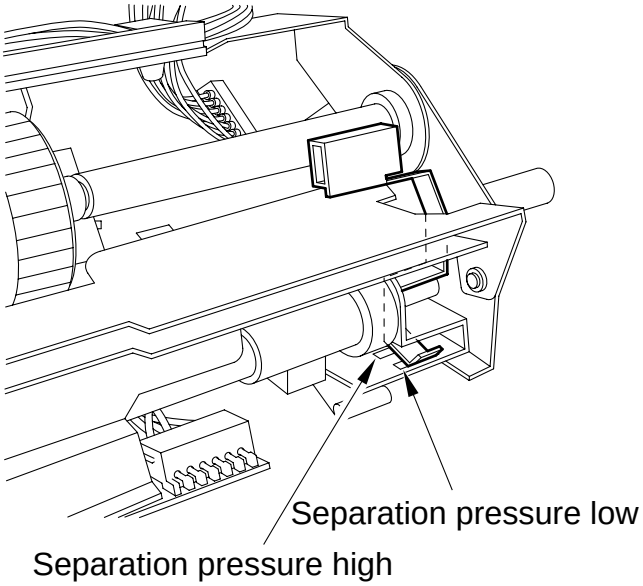

Figure 3-336b

6) Loosen the screw [13] on the thrust stopper [12] of the separation roller [9].

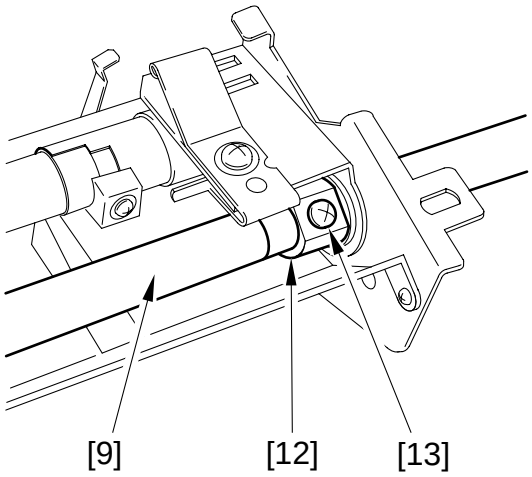

Figure 3-336c

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7) Remove the E-ring [14] and the gear [15] of the separation roller [9].

Caution:
The gear holds a pin. Take care not to lose it when removing the gear.

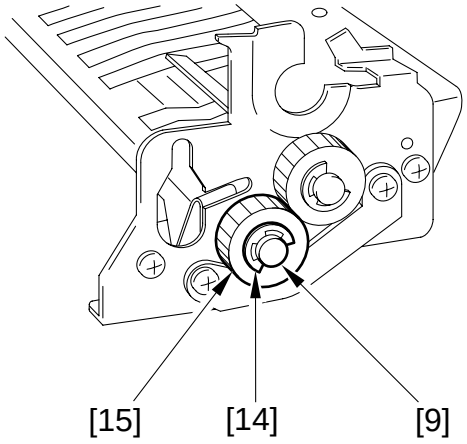

Figure 3-337

8) Remove the E-ring at the rear of the separation roller [9]; then, detach the separation belt [17].

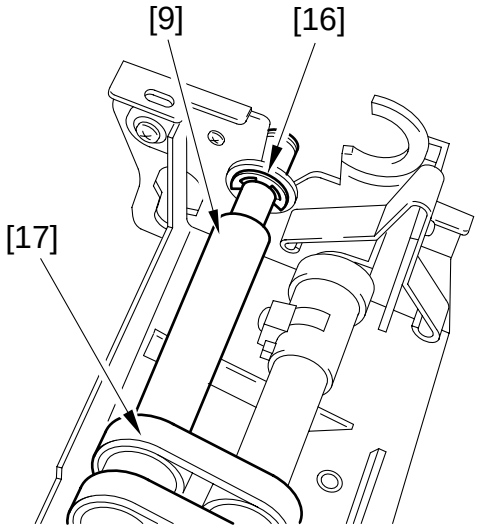

Figure 3-338

8. Removing the Reversing Roller

1) Remove the reversal motor unit. (Figure 3-201)
2) Remove the two screws [1] of the pickup front side plate side, and disconnect the connector [2]; then, detach the pre-reversing solenoid unit [3].

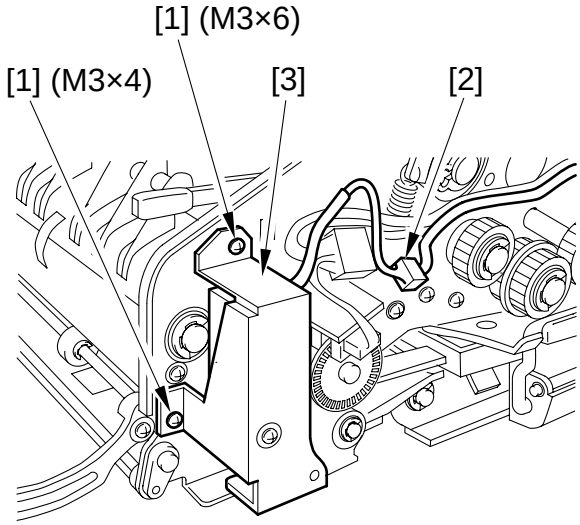

Figure 3-339

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3) Remove the two screws [4], and detach the reversing guide [5].

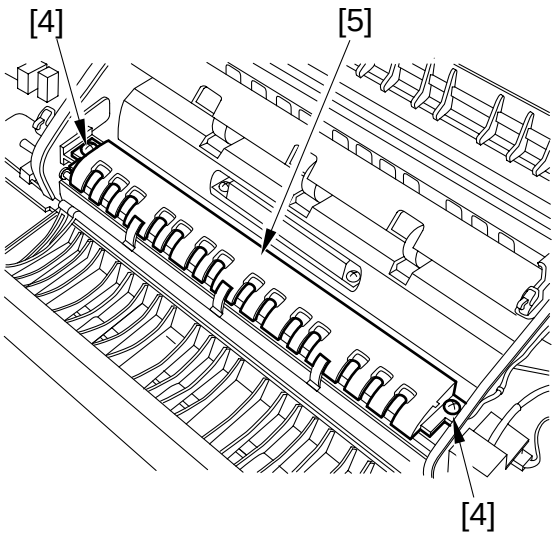

Figure 3-340

4) Remove the E-ring [7], gear [8], and parallel pin [9] of the reversing roller [6] (2 pc.).

Caution:
The gear holds a pin. Take care not to lose it when removing the gear.

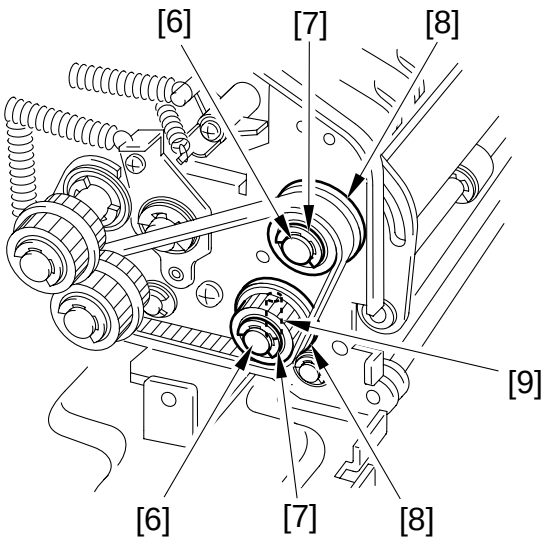

Figure 3-341

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5) Remove the grip ring [14] and the bearing [15] of the front side plate side of the reversing roller [6] (2 pc.); then, remove the E-ring [16] and the bearing [17] of the rear side plate side.
6) Pull out the reversing roller [6].

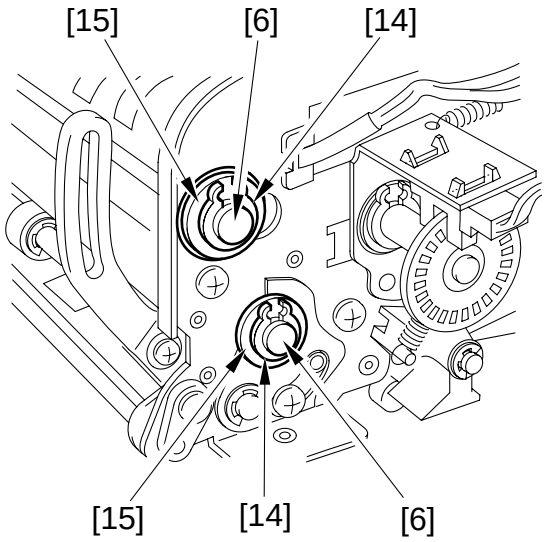

Figure 3-342a

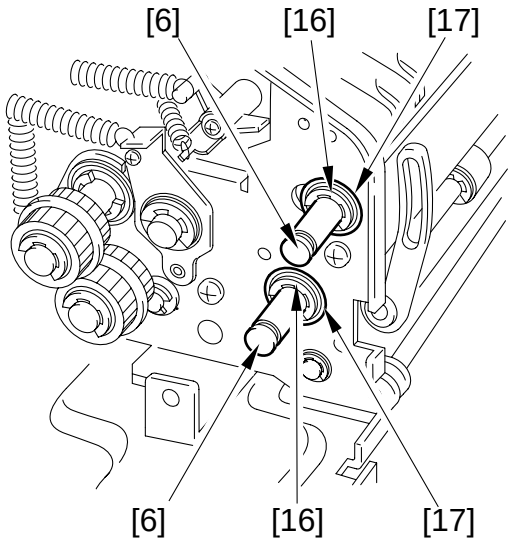

Figure 3-342b

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IV. REPLACING THE FEEDING BELT

1. Removing the Feeding Belt

1) Remove the two mounting screws [1], and detach the lower front cover [2].

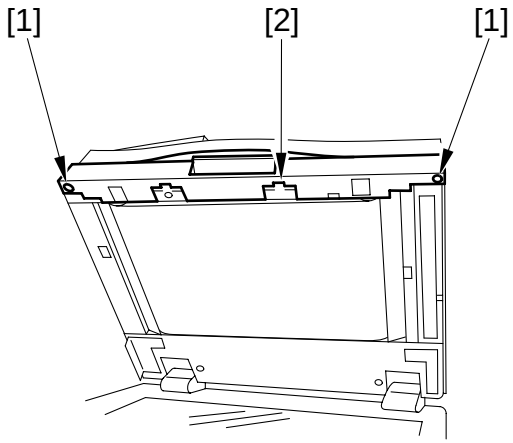

Figure 3-401

2) Release the fixing clip [3] (left, right).

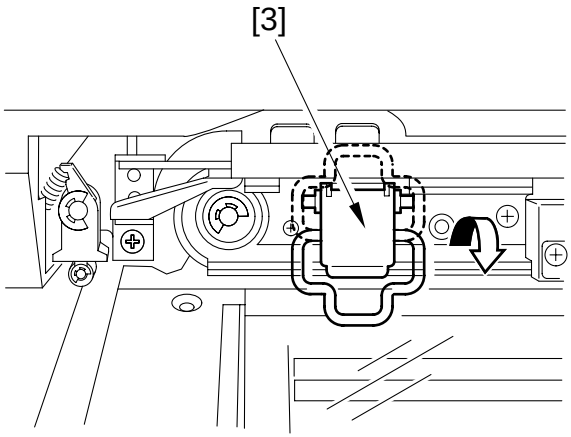

Figure 3-402a

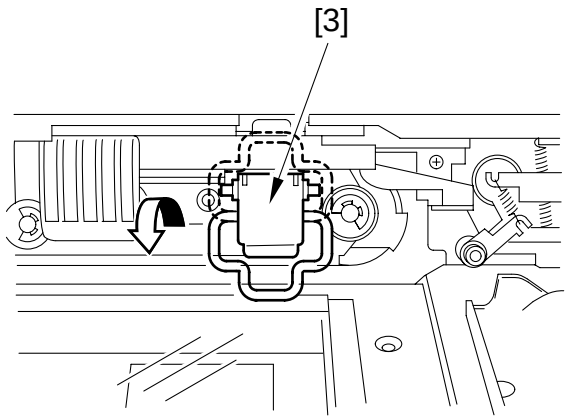

Figure 3-402b

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3) Turn the releasing lever [4] clockwise to reduce the tension.

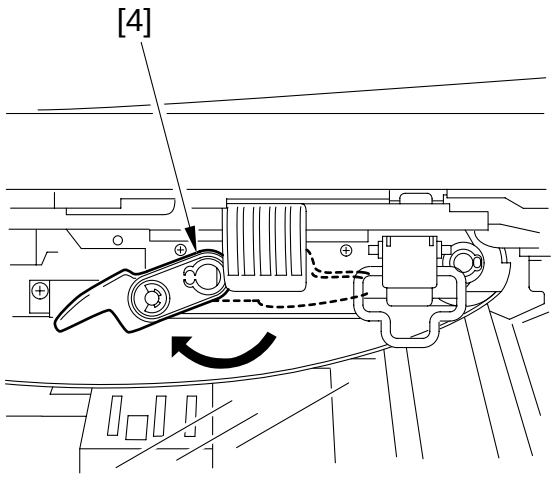

Figure 3-403

4) Remove the mounting screws [6] (2 each), and open the left/right arm [5] to the outside.

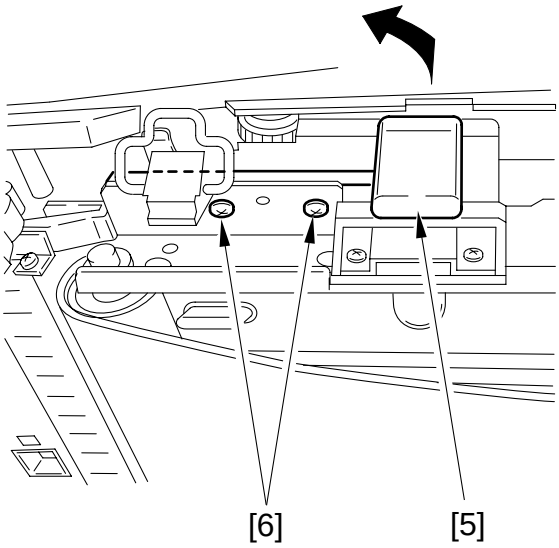

Figure 3-404a

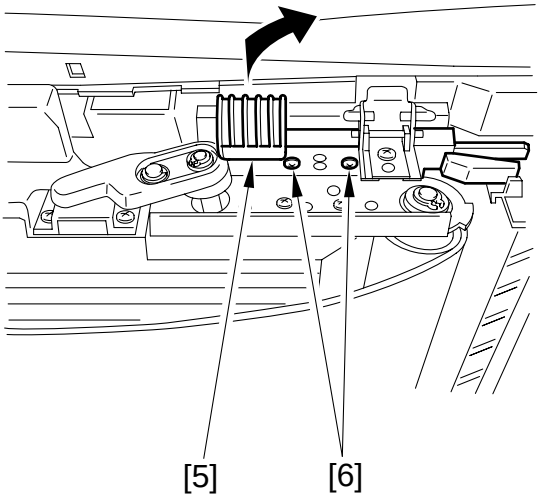

Figure 3-404b

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5) Slip out the feeding belt [7].

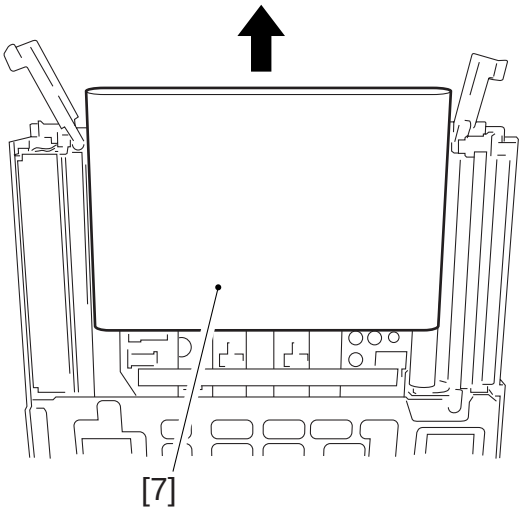

Figure 3-405

2. Mounting the Feeding Belt

1) Insert a screwdriver between the machine and the feeding assembly as shown to increase the gap.
2) Fit in the feeding belt, and pull up the screwdriver when the belt comes into contact with it; then, slip the feeding belt all the way in.

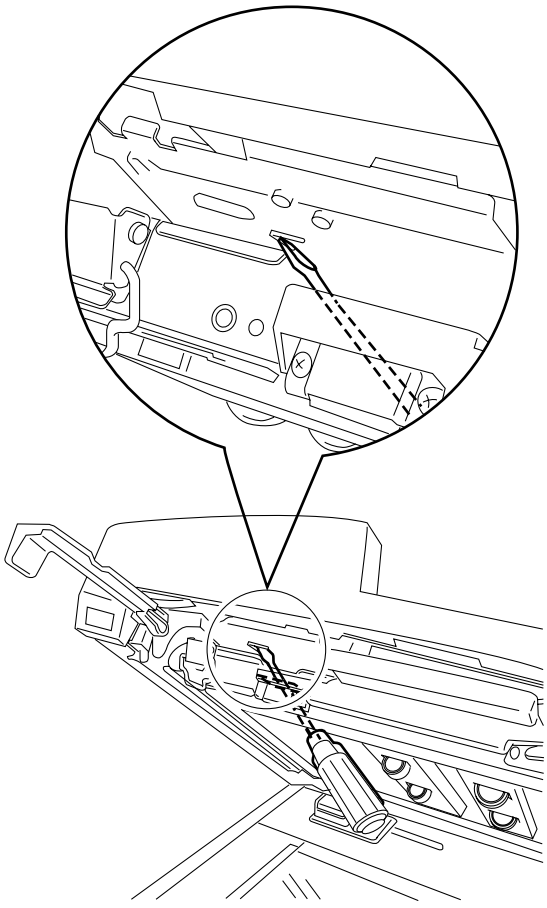

Figure 3-406

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CHAPTER 4

MAINTENANCE AND SERVICING

This chapter discusses those of the ADF's parts that require inspection and maintenance.

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II . DURABLES 4-1
III . SCHEDULED SERVICING CHART 4-2
IV . CLEANING 4-4
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B. Belt Assembly 4-4
C. Sensors 4-5

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I . PERIODICALLY REPLACED PARTS

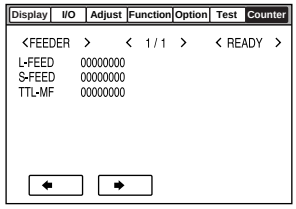
The machine does not have any parts requiring replacement on a periodical basis.

II . DURABLES

Some parts of the machine may require replacement once or more over the period warranty because of wear or damage. Replace them as necessary by consulting the following table of average lives (computed in reference to the number of copies picked up, which can be checked in the copier's service mode):

As of December 1998

No.	Parts name	Parts No.	Q'ty	Life (copies)	Remarks
1	Feeding belt	FC2-1210	1	200,000	Actual sheets handled.
2	Pickup roller	FB4-7640	2	250,000	May be checked in the copier's service mode; sum of L-FEED and S-FEED under COPIER>COUNTER> FEEDER.
3	Feeding roller*	FG6-2746 (separation unit)	1	250,000	
		FG6-2748 (feeding roller unit)	1		
4	Separation belt*	FG6-2746 (separation unit)	1	250,000	
		FE6-3059 (separation belt)	11		



*Replacement of the separation unit (FG6-2746) as a whole is recommended. However, the feeding roller unit (FG6-2748) or the separation belt (FE6-3059) on its own may be replaced.

Table 4-201

Note:
The values in the above table are estimates only and are subject to change based on future data.

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III . SCHEDULED SERVICING CHART

Caution:
Do not use solvents or oils not indicated herein.

△ : Clean ● : Replace × : Lubricate □ : Adjust ◎ : Inspect

Ref.	Parts name	Scheduled servicing		Remarks
		100,000 copies or 6 mon	200,000 copies or 1 yr	
1	Copyboard glass	△		Parts of the copier.
2	Original feeding belt		△	The numbers represent the actual copies made, which can be checked in the copier's service mode. May be checked in the copier's service mode; sum of L-FEED and S-FEED under COPIER>COUNTER>FEEDER
3	Original trailing edge sensor		△	
4	Pre-last original paper sensor		△	
5	Original sensor		△	
6	Separation paper sensor		△	
7	Skew paper sensor		△	
8	Pre-registration paper sensor		△	
9	Post-registration paper sensor		△	
10	Reversal paper sensor		△	
11	Manual feed registration roller paper sensor		△	
12	Pickup roller	△		
13	Feeding roller	△		
14	Separation belt	△		
15	Pull-out roller		△	
16	Registration roller		△	
17	Reversal roller A, roll		△	
18	Reversal roller B, roll		△	
19	Manual roller, roll		△	
20	Delivery roller, roll		△	

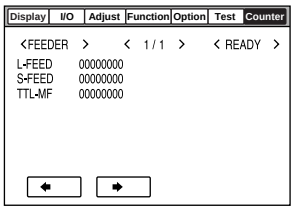

Table 4-301

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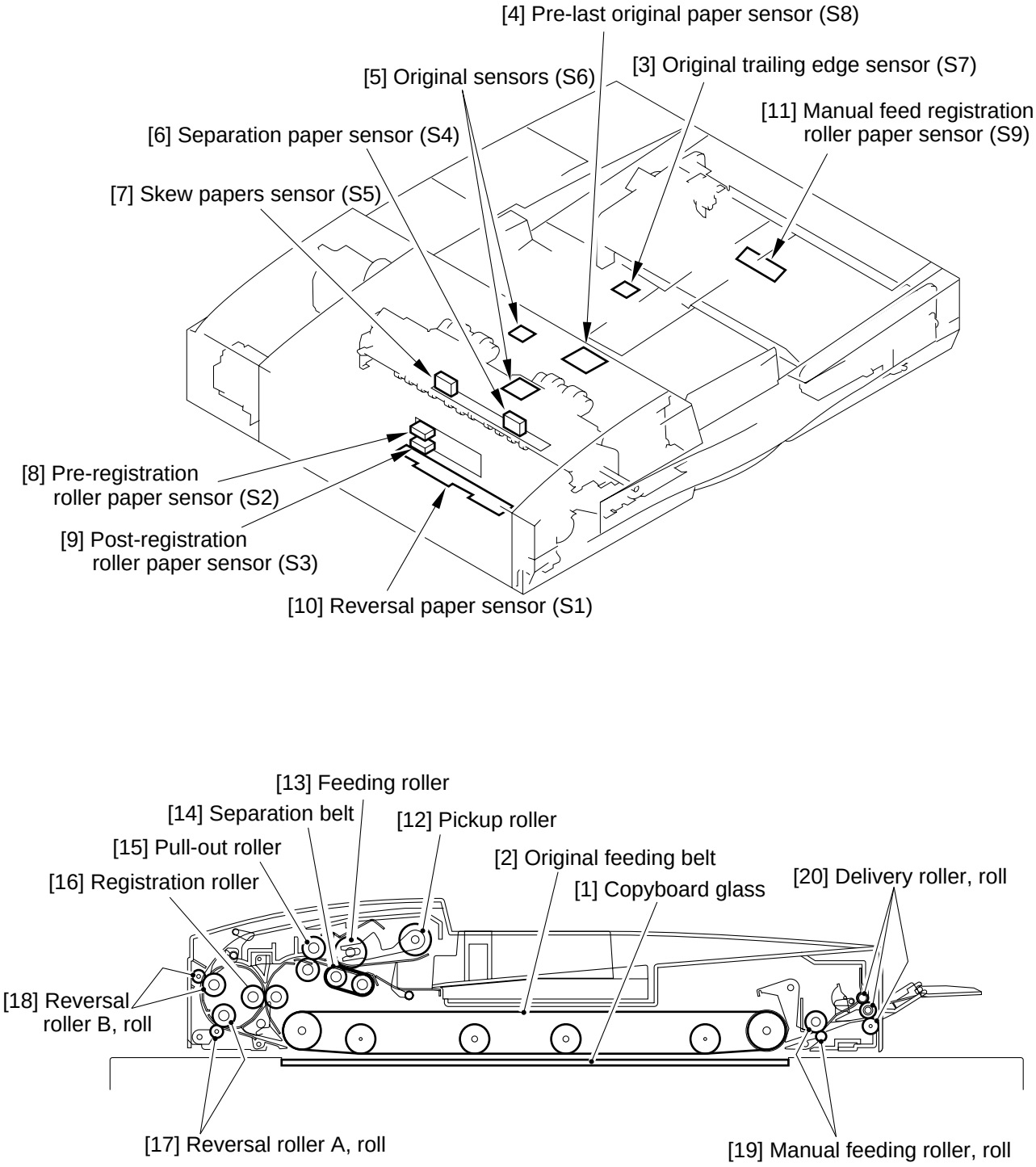
[4] Pre-last original paper sensor (S8)
[3] Original trailing edge sensor (S7)
[5] Original sensors (S6)
[11] Manual feed registration roller paper sensor (S9)
[6] Separation paper sensor (S4)
[7] Skew papers sensor (S5)
[8] Pre-registration roller paper sensor (S2)
[9] Post-registration roller paper sensor (S3)
[10] Reversal paper sensor (S1)
[13] Feeding roller
[14] Separation belt
[12] Pickup roller
[15] Pull-out roller
[2] Original feeding belt
[20] Delivery roller, roll
[16] Registration roller
[1] Copyboard glass
[18] Reversal roller B, roll
[17] Reversal roller A, roll
[19] Manual feeding roller, roll

Figure 4-301

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IV . CLEANING

A. Copyboard Glass

1) Wipe the copier's copyboard glass with a cloth moistened with alcohol.

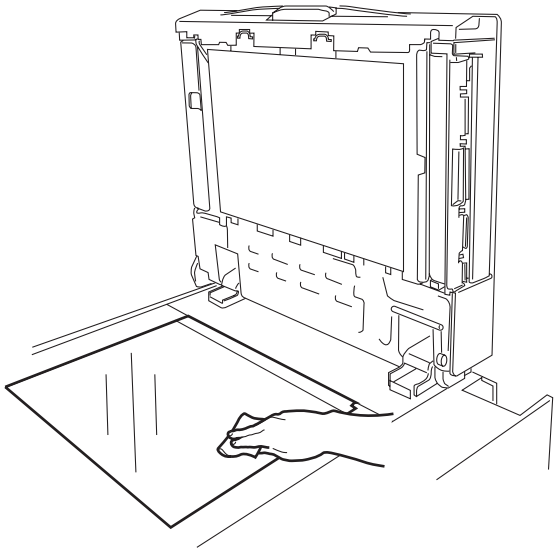

Figure 4-401

B. Belt Assembly

1) Dry wipe the original feeding belt while moving it in the direction of the arrow.
If the dirt is appreciable, wipe it with a cloth moistened with mild detergent solution; then, dry wipe it.

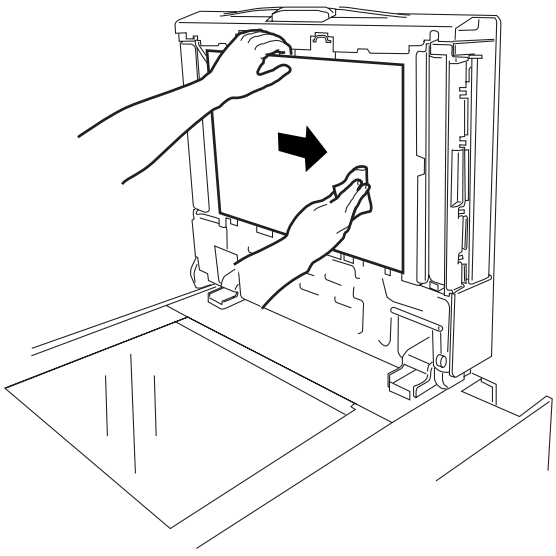

Figure 4-402

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C. Sensors

1. Pre-Last Original Sensor

1) Clean the window of the sensor on the original tray with a blower brush.

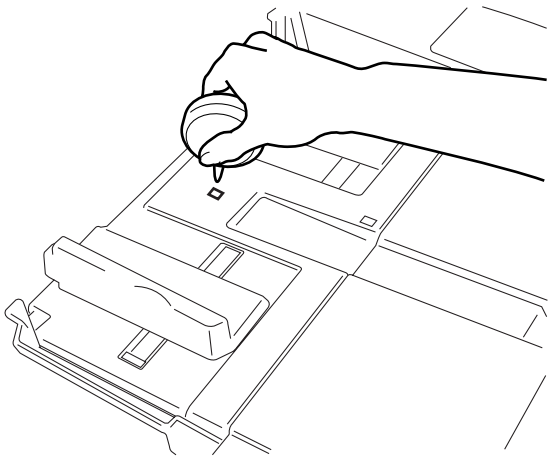

Figure 4-403

2. Original Trailing Edge Sensor

1) Clean the window of the sensor on the original tray with a blower brush.

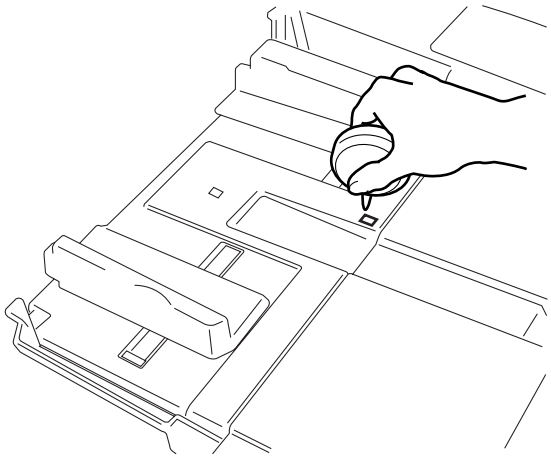

Figure 4-404

3. Original Sensor

1) Remove the pickup assembly cover. (Figure 3-308a)
2) Clean the light-receiving area of the sensor stay and the light-emitting area at the rear of the guide plate with a blower brush.

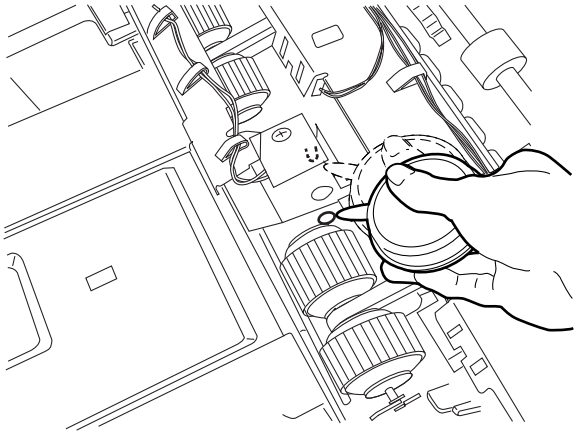

Figure 4-405

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4. Separation Paper/Skew Paper Sensor

1) Open the pickup assembly upper cover.
2) Open the registration guide, and put a blower brush between the separation stay and the separation guide to clean. (The separation paper sensor is at the front, while the skew paper sensor is at the rear.)

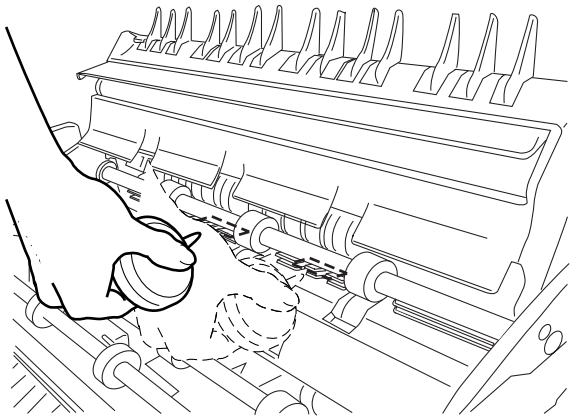

Figure 4-406

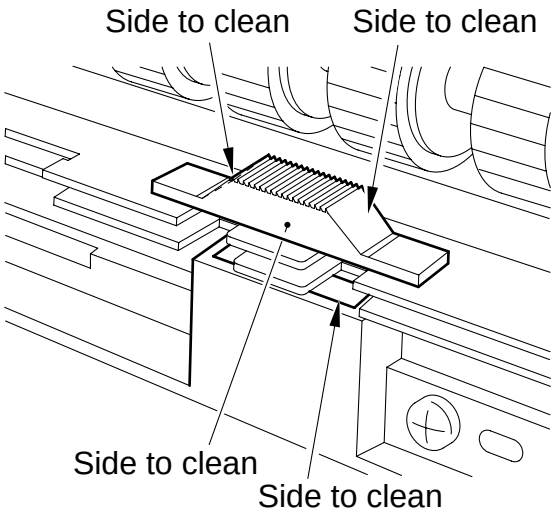

Figure 4-407

5. Pre-Registration Roller Paper Sensor

1) Remove the reversing guide. (Figure 3-328)
2) Clean the three faces of the prism found behind the reversing guide.

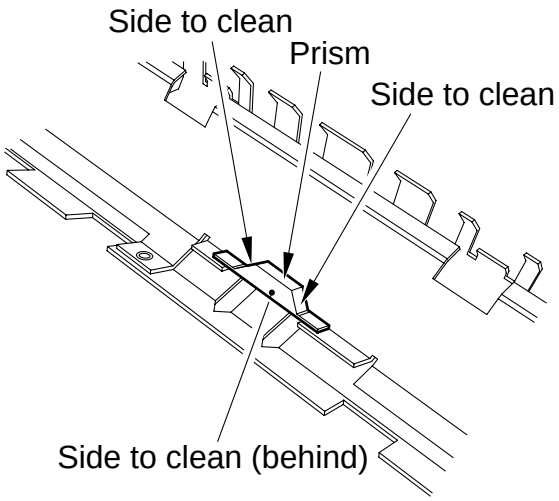

Figure 4-408

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3) Remove the registration sensor PCB. (Figure 3-330)
4) Clean the two points of the filter face of the sensor.

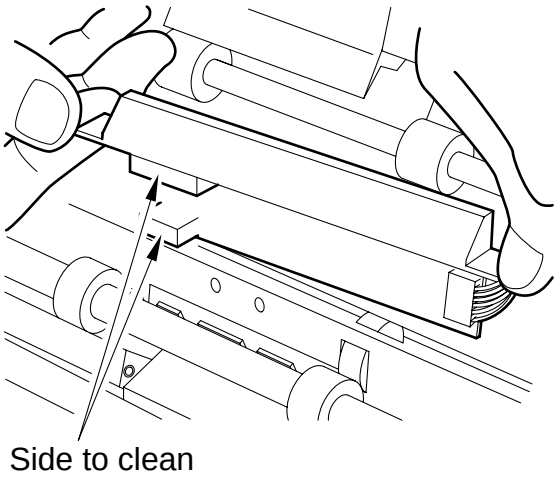

Figure 4-409

6. Post-Registration Roller Paper Sensor

1) Open the pickup upper cover.
2) Remove the reversing guide. (Figure 3-328)
3) Clean the three faces of the prism of the post-registration roller paper sensor.

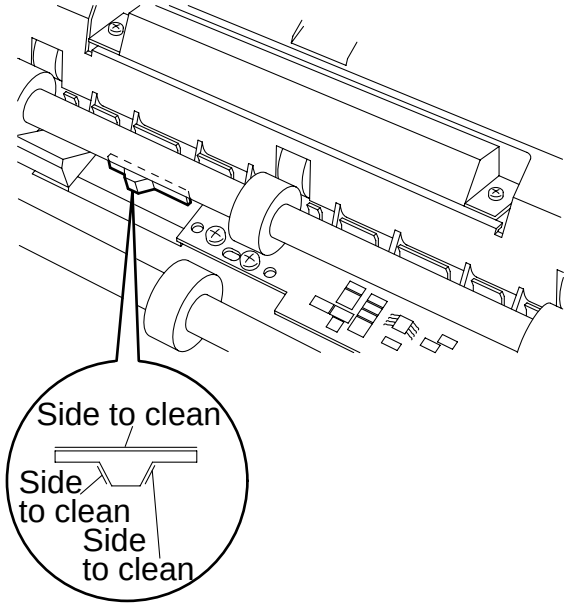

Figure 4-410

7. Reversal Paper Sensor

1) Remove the reversing guide. (Figure 3-328)
2) Remove the screws [1], and detach the reversal sensor [2].

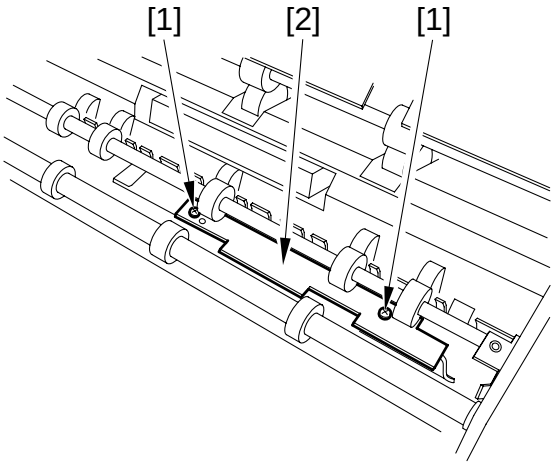

Figure 4-411

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3) Clean the filter face of the reversal sensor [2] with a blower brush.

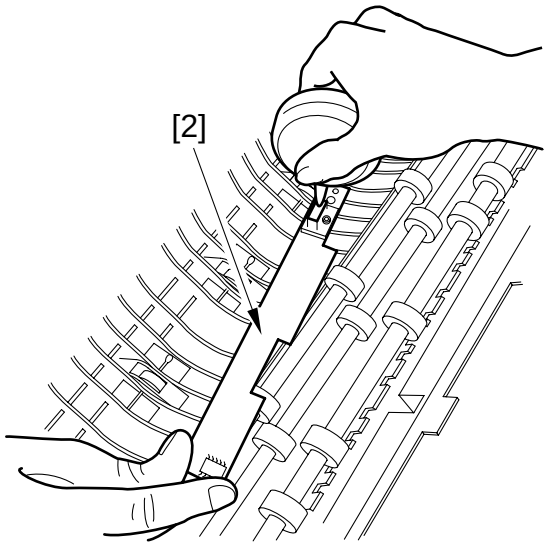

Figure 4-412

4) Open the ADF fully. (Figure 3-103)
5) While opening the pickup middle guide to the left of the feeding belt, clean the prism on the reflecting side of the reversal sensor with a blower brush (found in the rear).

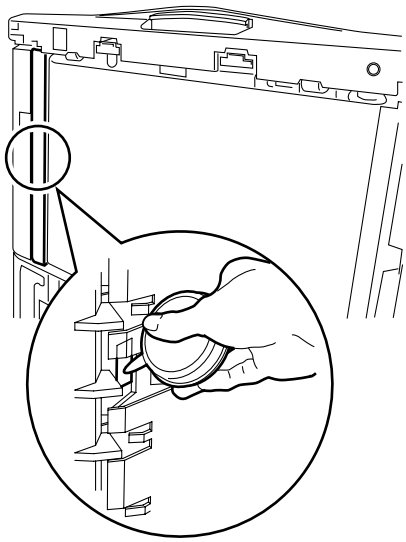

Figure 4-413

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8. Manual Feed Registration Roller Paper Sensor

1) Remove the front cover.
2) Remove the main cover.
3) Clean the detecting hole of the registration sensor on the delivery upper guide with a blower brush.

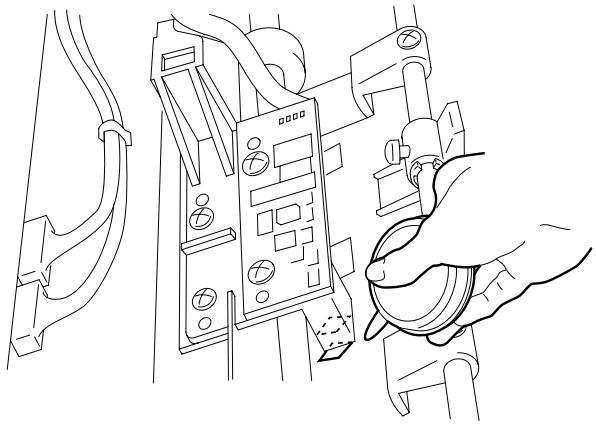

Figure 4-414

9. Pickup Roller

1) Open the pickup assembly upper cover.
2) Remove the pickup cover.
3) Clean the roller surface with lint-free paper or a cloth moistened with alcohol.

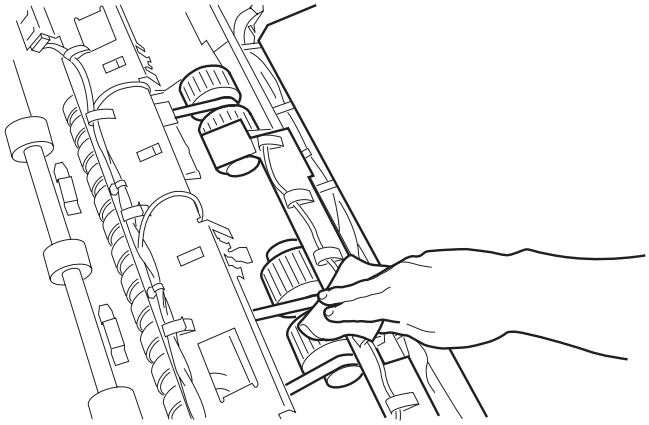

Figure 4-415

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10. Separation Belt/Feeding Roller

1) Obtain one sheet of A4 or LTR paper.
2) Remove the ADF controller cover, and set the DIP switch (SW1) on the ADF controller PCB as shown.
3) Press the push switch (SW2) on the ADF controller PBC.
   • The separation assembly starts to operate.
4) Moisten the copy paper obtained in step 1) with alcohol.
5) Hold the copy paper against the pickup slot to clean the roller.

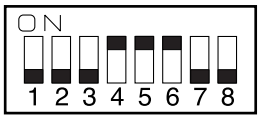

Figure 4-416

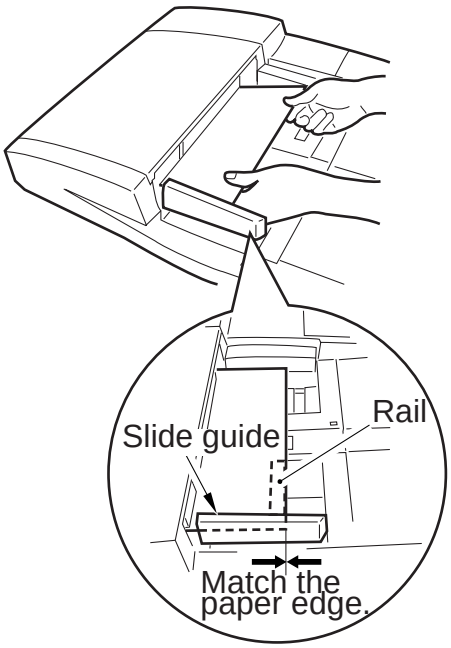

Figure 4-417

Caution:
The pull-out roller is also operating. Be sure to hold onto the copy paper, not letting it go: if A4, as shown in Figure 4-417; if LTR, on the other hand, as shown in Figure 4-418.

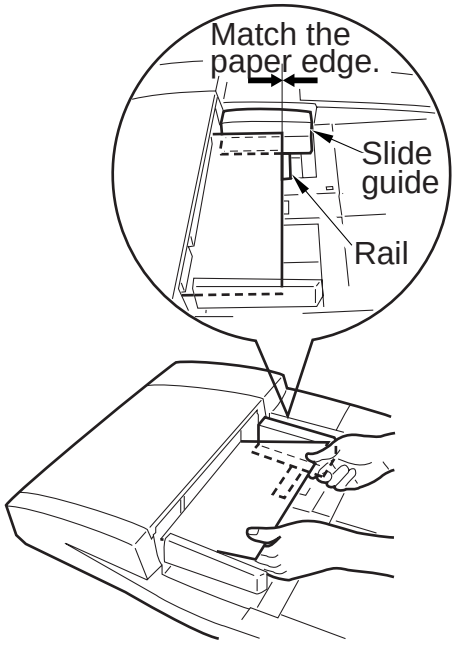

Figure 4-418

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6) After cleaning, press the push switch (SW2) once again.
   • The separation assembly will stop operating.

11. Pull-Out Roller

1) Open the upper cover, and open the feeding guide.
2) Remove the ADF controller cover, and set the DIP switch (SW1) on the ADF controller PCB as shown.
3) Press the push switch (SW2) on the ADF controller PCB.
   • The separation assembly will start to operate.
4) Clean the pull-out roller with lint-free paper moistened with alcohol.

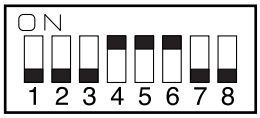

Figure 4-419

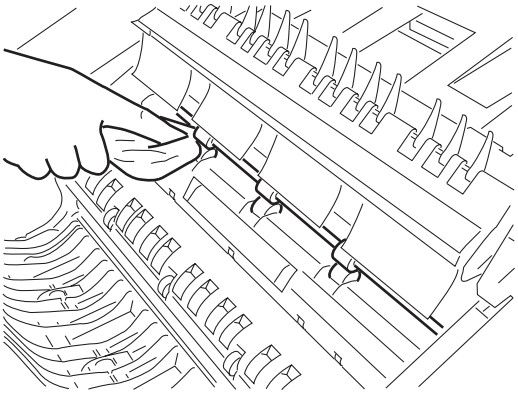

Figure 4-420

12. Registration Roller

1) Open the upper cover, and open the feeding guide.
2) Remove the reversing guide.
3) Remove the ADF controller cover, and set the DIP switch (SW1) on the ADF controller PCB as shown.
4) Press the push switch (SW2) on the ADF controller PCB.
   • The reversing assembly starts to operate.
5) Clean the registration roller with lint-free paper moistened with alcohol.

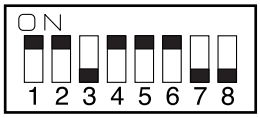

Figure 4-421

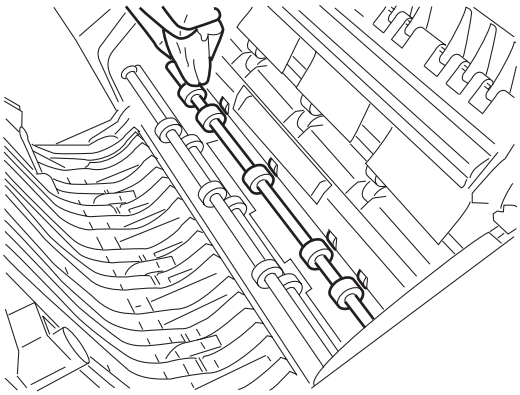

Figure 4-422

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13. Reversing Roller A/Roll

1) Open the pickup assembly upper cover.
2) Clean the reversing roller A [1] and the roll [2] with lint-free paper or a cloth moistened with alcohol.

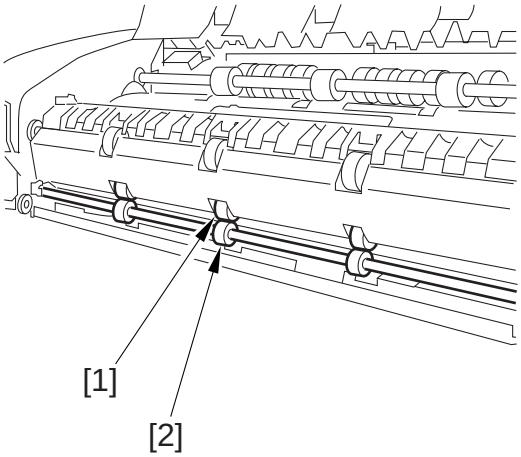

Figure 4-423

14. Reversing Roller B/Roll

1) Open the pickup assembly upper cover.
2) Clean the reversing roller B [1] and the roll [2] with lint-free paper or a cloth moistened with alcohol.

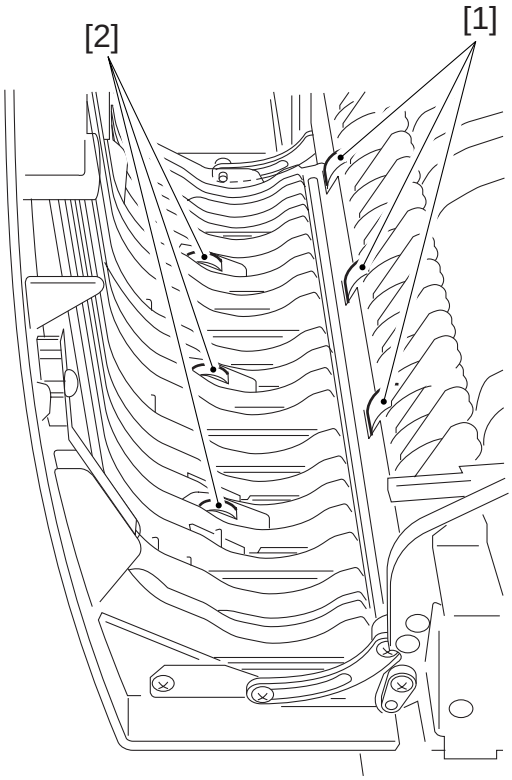

Figure 4-424

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15. Manual Feed Roller/Roll

1) Open the manual feed tray.
2) Clean the manual feed (delivery) roller [1] and the roll [2] with lint-free paper or a cloth moistened with alcohol.

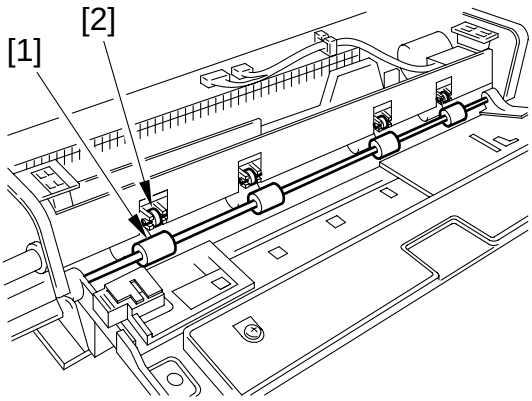

Figure 4-425

16. Delivery Roller/Roll

1) With the manual feed tray closed, clean the delivery (manual fed) roller [1] and the roll [2] with lint-free paper or a cloth moistened with alcohol.

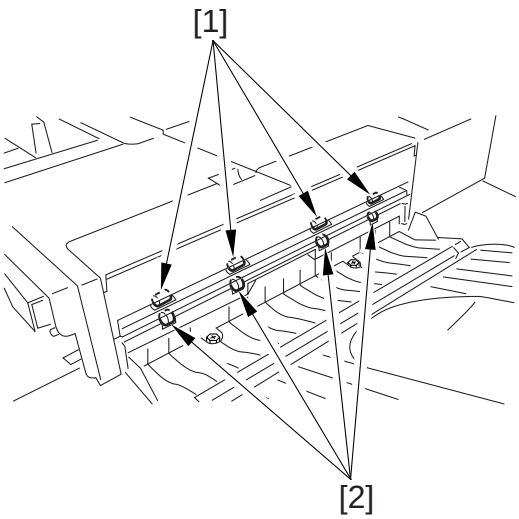

Figure 4-426

17. Manual Feed Registration Roller/Roll

1) Remove the main cover.
2) Remove the two screws [1], and detach the manual feed registration sensor PCB [2].

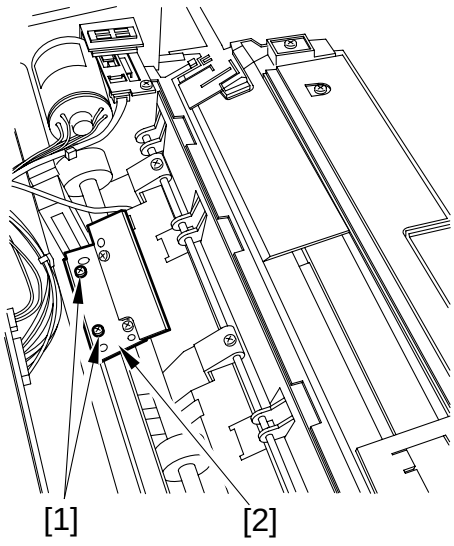

Figure 4-427

3) Clean the manual feed registration roller [3] with lint-free paper or a cloth moistened with alcohol.

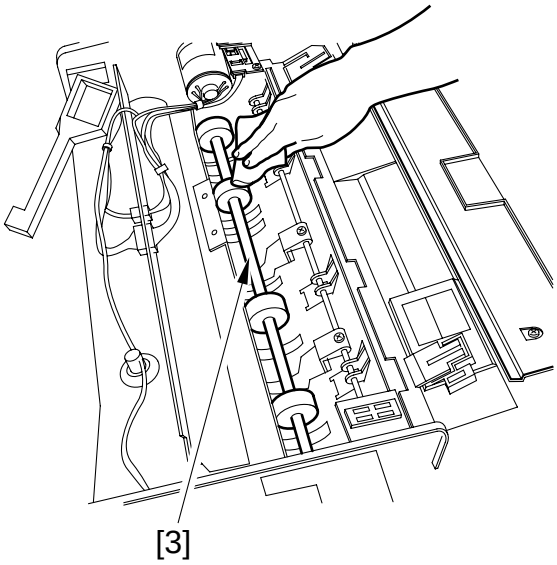

Figure 4-428

4) Shift up the ADF, and open the delivery lower guide [4]; then, clean the manual feed registration roller roll [5] with lint-free paper or a cloth moistened with alcohol.

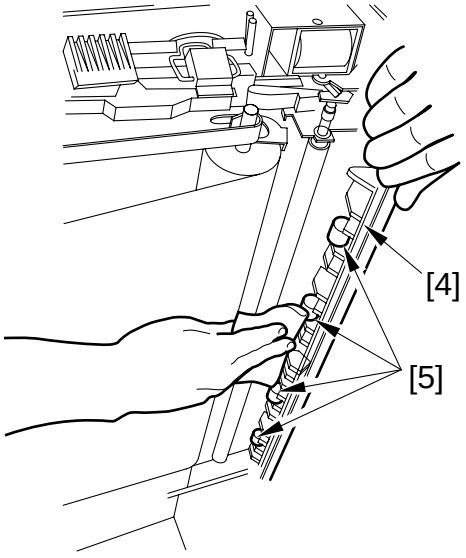

Figure 4-429

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CHAPTER 5

TROUBLESHOOTING

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I . STANDARDS AND ADJUSTMENTS

A. Basic Adjustments

The machine's basic adjustments include the following, which must be performed in sequence:

[1] Adjusting the height of the ADF
[2] Adjusting the orientation of the ADF
[3] Removing the skew.
[4] Adjusting the horizontal registration
[5] Adjusting the original stop position

1. Adjusting the Height of the ADF

1) Remove the two screws, and detach the lower front cover.

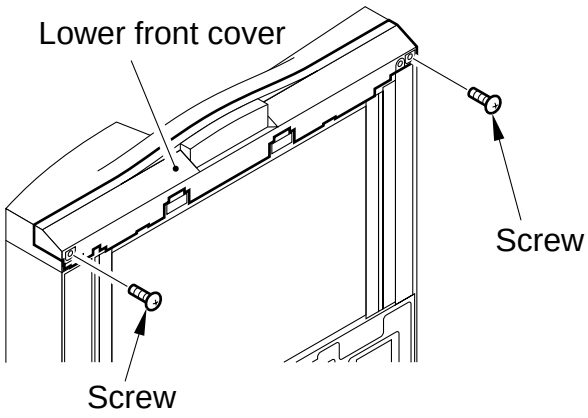

Figure 5-101

2) With the ADF closed, make adjustments by loosening the two fixing screws [5] of the magnet catch [4] so that both rubber feet [3] are in contact.
3) After making adjustments, tighten the fixing screws of the magnet catch, and attach the front cover.

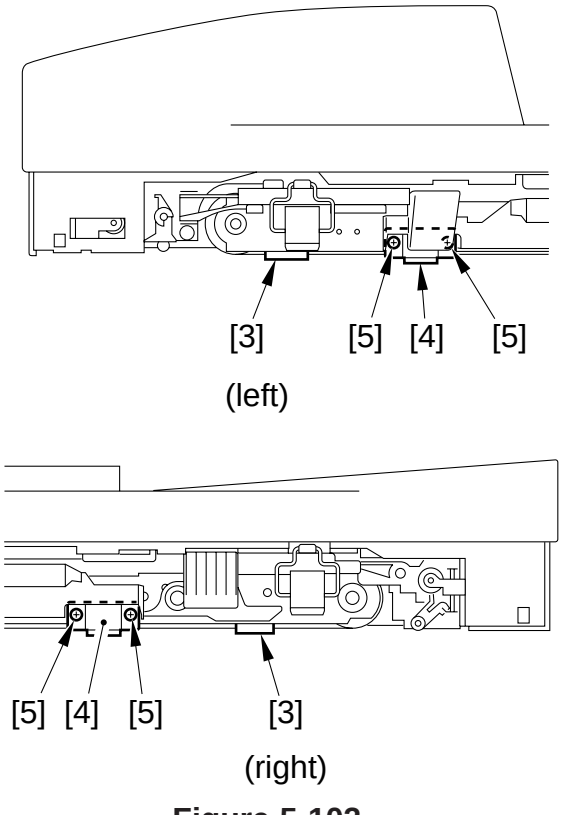

Figure 5-102

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2. Adjusting the Orientation of the ADF

Adjust the orientation of the machine so that its feeding path is correctly matched with that of the copier.

1) Using an A4 or LTR sheet of copy paper, prepare a test chart like the one shown in Figure 5-103.

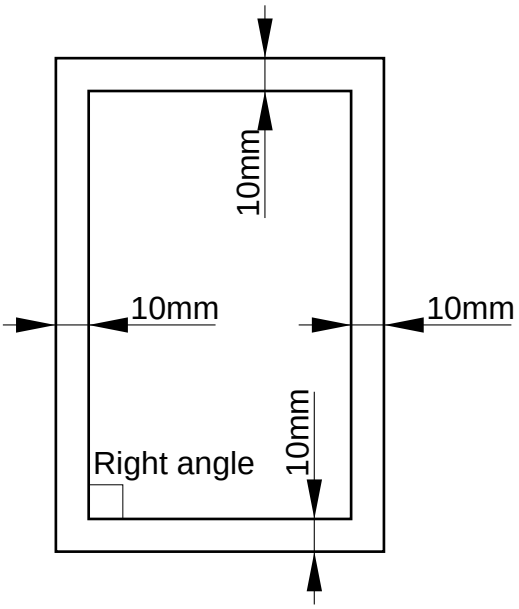

Figure 5-103

2) Place the test chart on the original tray, and make a Direct (1:1) copy in stream reading mode.

Caution:
Be sure to use stream reading when making a copy.

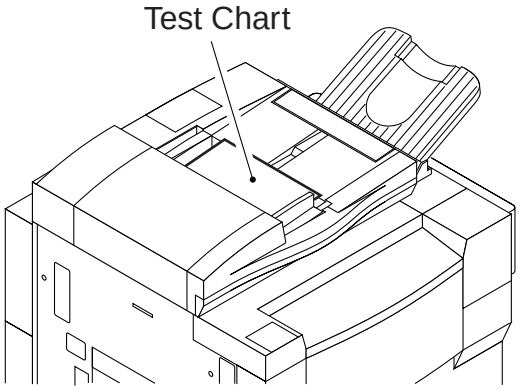

Figure 5-104

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3) Place another sheet of copy paper over the copy made in step 2) to check the angle.
A < 1 mm
B < 1 mm

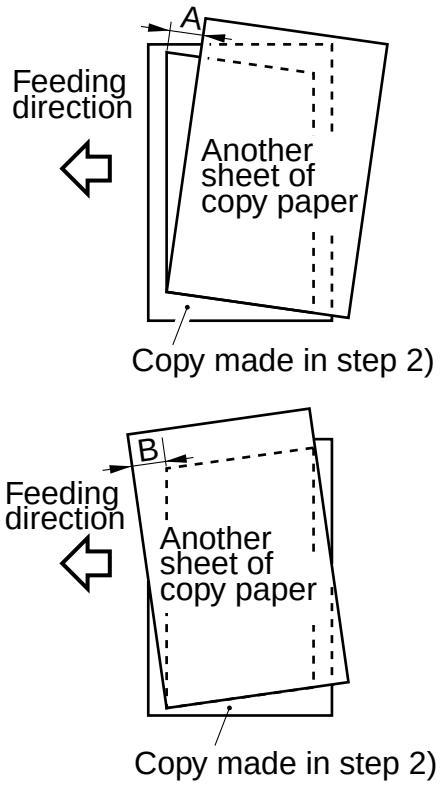
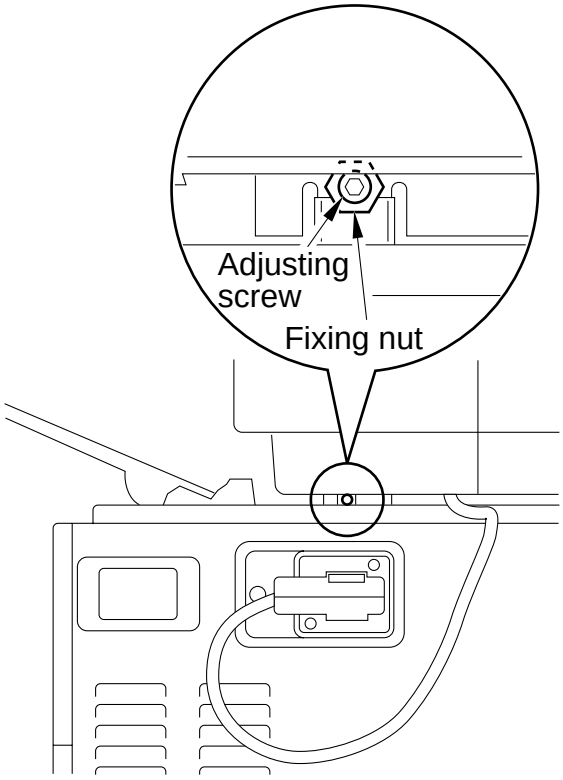


Figure 5-105

4) If the angle is not as indicated, loosen the fixing nut at the rear of the right hinge unit, and turn the adjusting screw to make adjustments.

Caution:
Be sure that the ADF is kept open when turning the adjusting screw.

5) Tighten the fixing nut to secure the adjusting screw.



If A>0, turn the adjusting screw counterclockwise.
If B>0, turn the adjusting screw clockwise.

Figure 5-106

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3. Removing the Skew

Adjustments must be made for the following three:

[1] Pickup from the original tray
[2] Pickup from the manual feeder tray
[3] Reversal operation (duplexing)

a. Pickup from the Original Tray

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as follows:

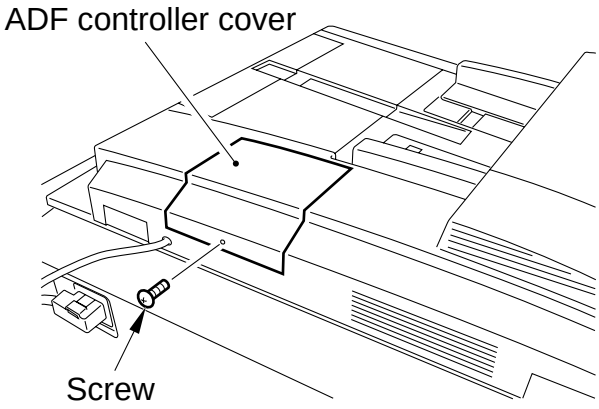

Figure 5-107

Figure 5-108

3) Place an A4 or LTR sheet of copy paper on the original tray.

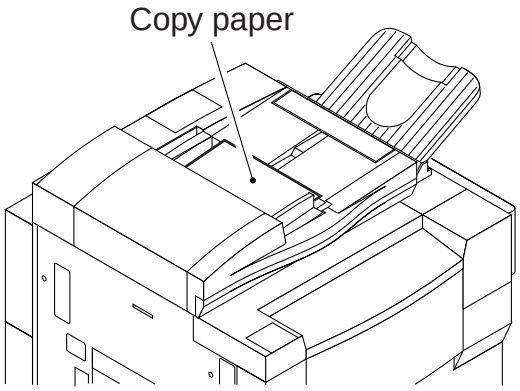

Figure 5-109

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4) Press the push switch (SW2) on the ADF controller PCB once.
   • The original will be picked up and placed on the copyboard glass.

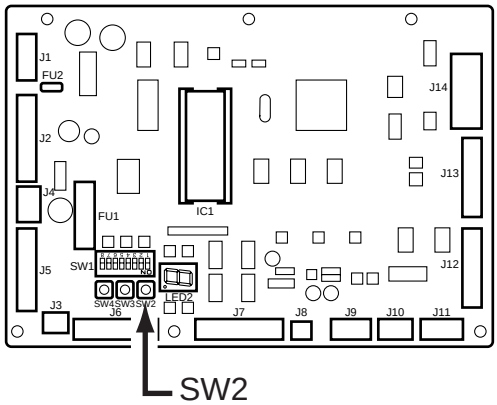

Figure 5-110

5) Open the ADF slowly, and check to make sure that A and B shown in Figure 5-111 are 2 mm or less.
   Close the ADF, and press the push switch (SW2) on the ADF controller PCB once.
   • The original will be delivered to the delivery tray.

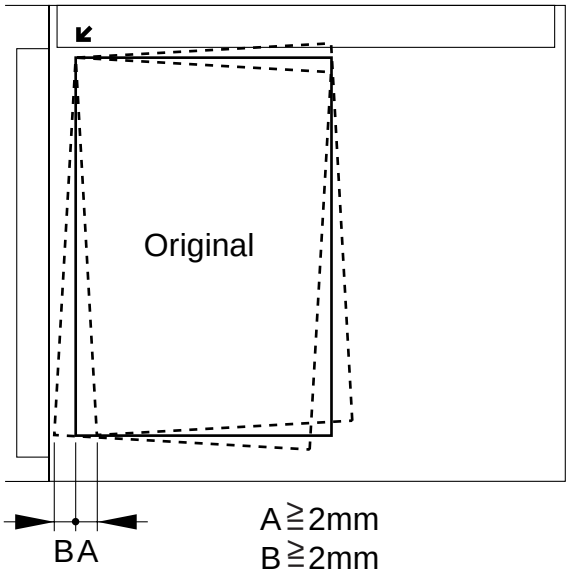

Figure 5-111

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If Not as Indicated

Adjust the position of the registration roller.

1) Remove four screws, and detach the front cover.

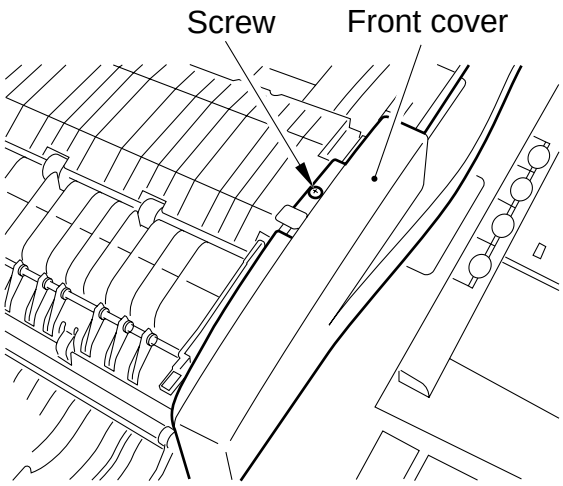

Figure 5-112-1

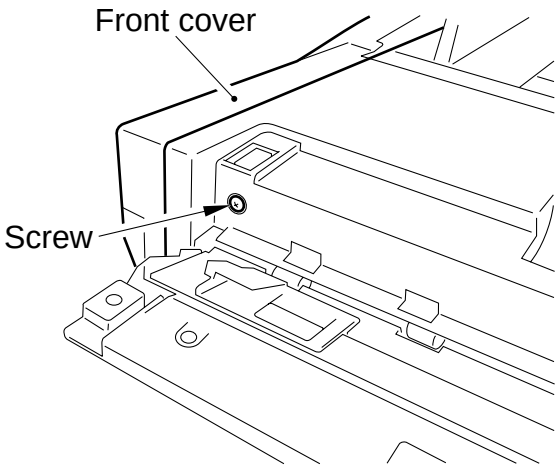

Figure 5-112-2

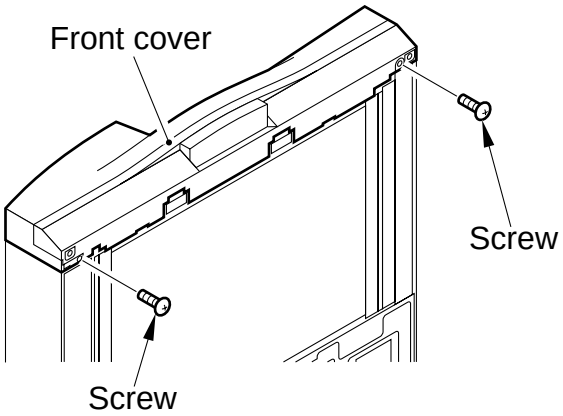

Figure 5-112-3

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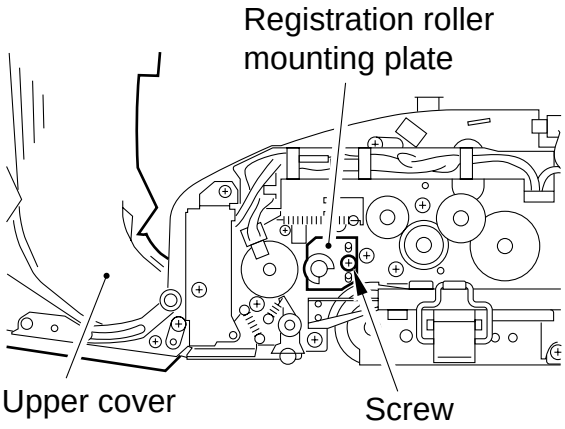
2) Open the upper cover, and loosen the fixing screw on the registration roller mounting plate; then, adjust the mounting angle of the registration roller by sliding mounting plate up or down.



If A>0, slide the mounting plate down.
If B>0, slide the mounting plate up.

Figure 5-113

3) After making adjustments, tighten the fixing screw on the registration roller mounting plate.
4) Put the DIP switch (SW1) on the ADF controller PCB back to its original state, and attach the ADF controller cover.

b. Pickup from the Manual feeder Tray

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-115.

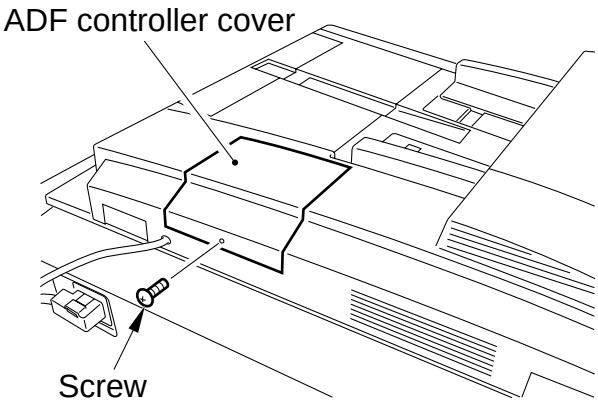


Figure 5-114

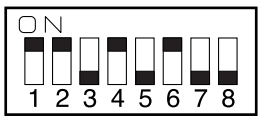


Figure 5-115

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3) Open the manual feeder tray, and place an A4 or LTR sheet of copy paper.
   • Be sure to butt the copy paper against the rear.

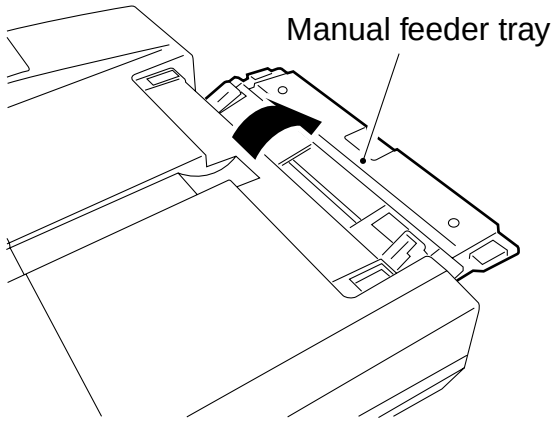

Figure 5-116

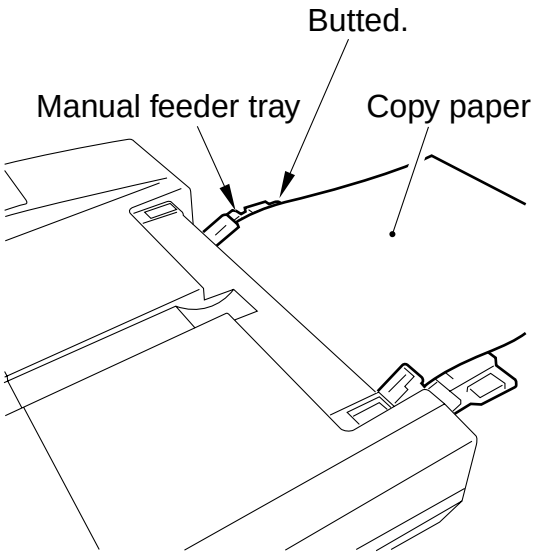

Figure 5-117

4) Press the push switch (SW2) on the ADF controller PCB once.
   • The original will be picked up and placed on the copyboard glass.

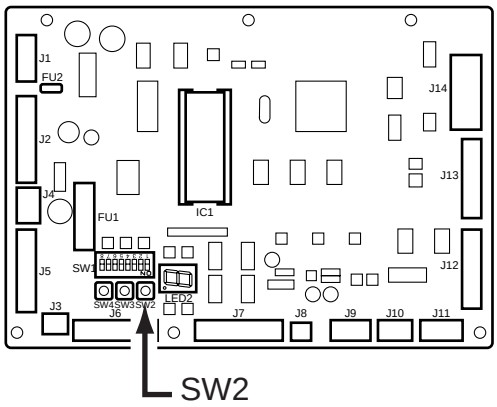

Figure 5-118

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5) Open the ADF slowly, and check to make sure that A and B shown in Figure 5-119-1 are within 2 mm.
Close the ADF, and press the push switch (SW2) on the ADF controller PCB once.
• The original is delivered to the delivery tray.

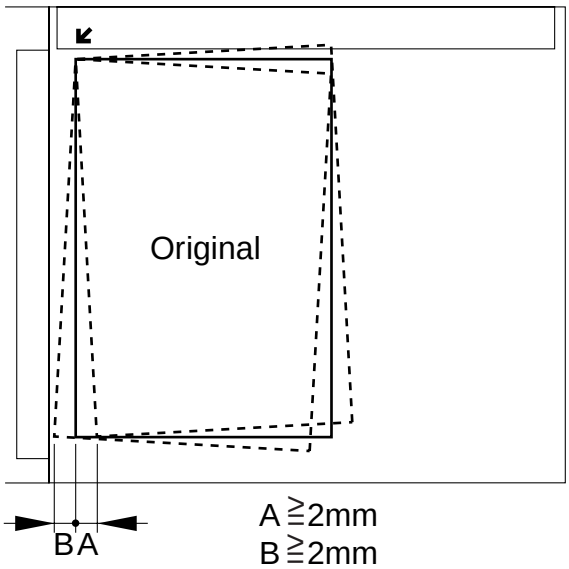

Figure 5-119-1

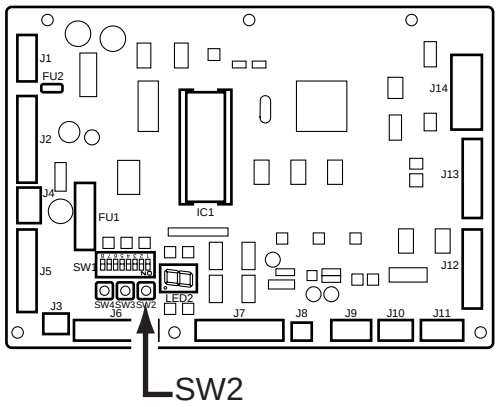

Figure 5-119-2

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If Not as Indicated

Adjust the position of the manual feeder registration roller.

1) Remove the four screws, and detach the front cover.

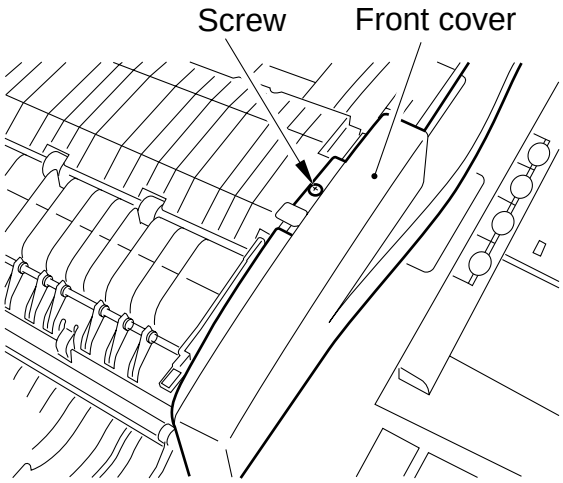

Figure 5-120-1

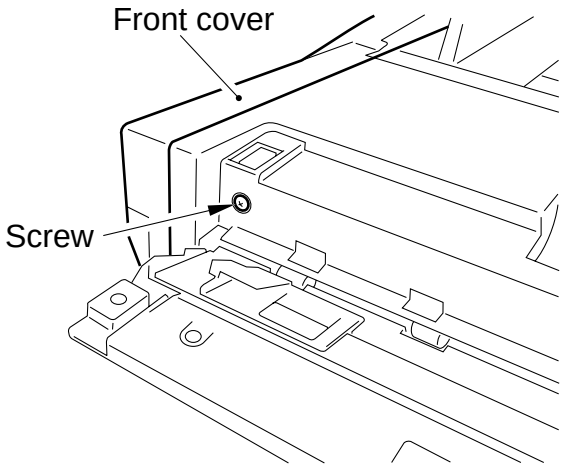

Figure 5-120-2

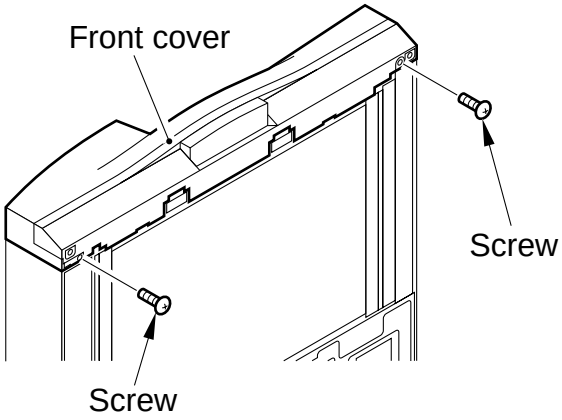

Figure 5-120-3

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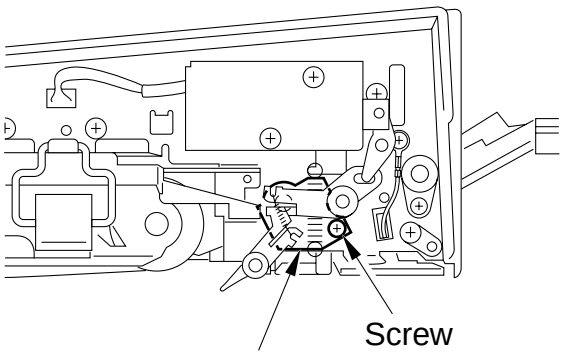
2) Loosen the fixing screw of the manual feeder registration roller mount, and slide the mounting plate to the left or right to adjust the mounting angle of the registration roller.
3) After making adjustments, tighten the fixing screw of the manual registration roller mounting plate.
4) Put the DIP switch (SW1) on the ADF controller PCB back to its original settings, and attach the ADF controller cover.



Manual feed registration roller mount

If A>0, slide the mount to the right.
If B>0, slide the mount to the left.

Figure 5-121

c. Reversal (duplexing)

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) of the ADF controller PCB as shown in Figure 5-123 .

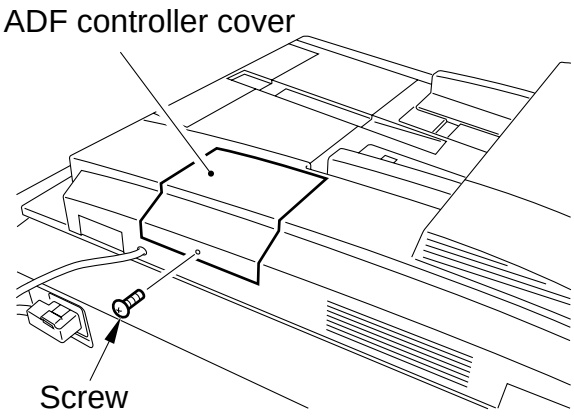


Figure 5-122

Figure 5-123

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3) Place an A4 or LTR sheet of copy paper on the original tray.

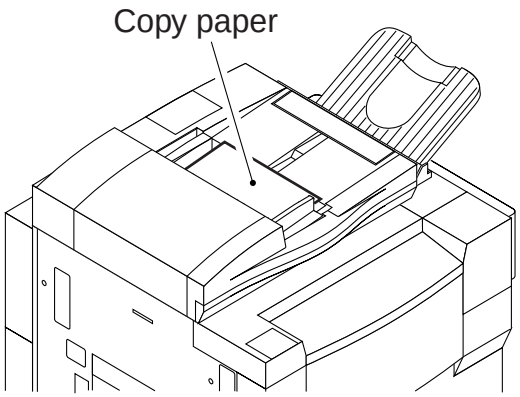

Figure 5-124

4) Press the push switch (SW2) on the ADF controller PCB twice.
   - A single press on the push switch (SW2) causes the machine to pick up an original and stop it on the copyboard glass (clockwise rotation).
     Another press will cause the machine to turn over the original and place it on the copyboard glass.

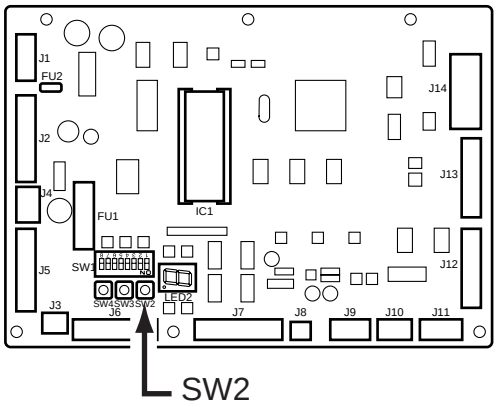

Figure 5-125

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5) Open the ADF slowly, and check to make sure that A and B shown in Figure 5-126 are within 2 mm.
Close the ADF, and press the push switch (SW2) on the ADF controller PCB once.
• The original will be delivered to the delivery tray.

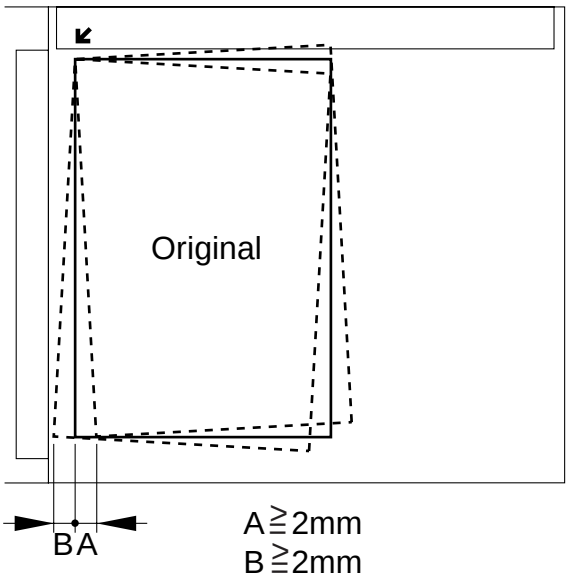

Figure 5-126

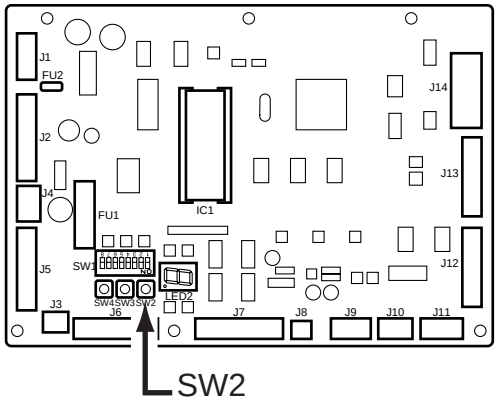

Figure 5-127

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If Not as Indicated

Adjust the position of the reversal registration roller.

1) Remove the four screws, and detach the front cover.

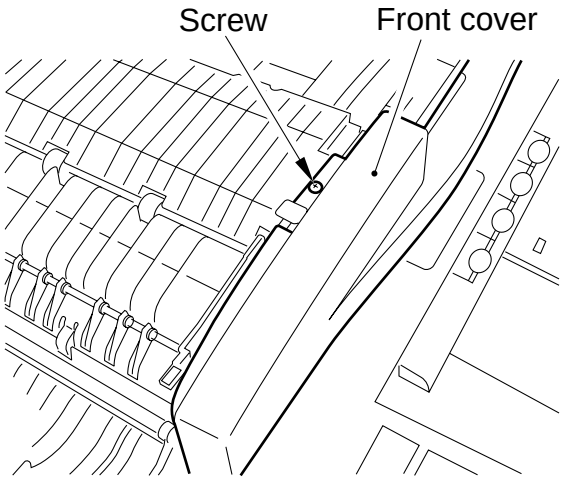

Figure 5-128-1

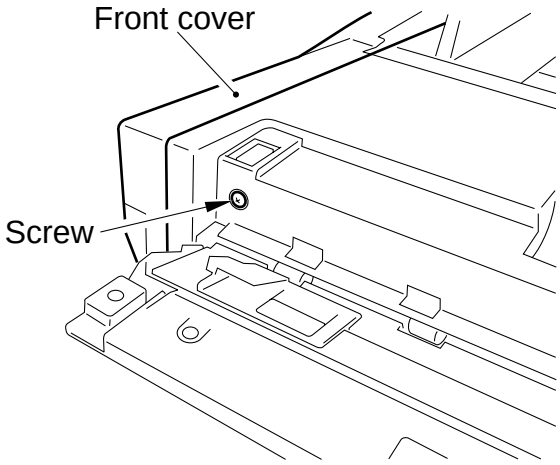

Figure 5-128-2

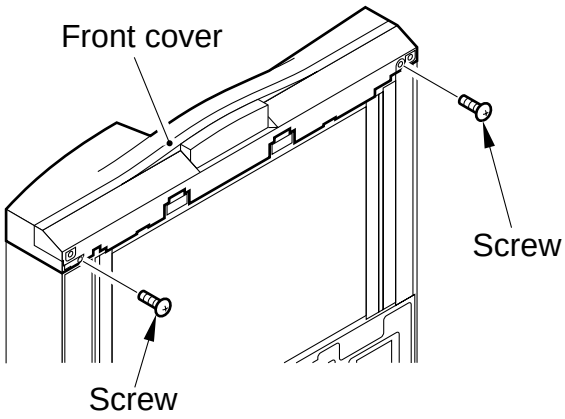

Figure 5-128-3

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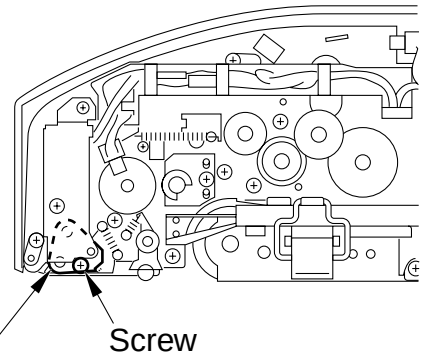
2) Loosen the fixing screw of the reversal registration roller mounting plate, and slide the mounting plate to adjust the mounting angle of the registration roller.
3) After making adjustments, tighten the fixing screw of the reversing registration roller mounting plate.
4) Put the DIP switch (SW1) on the ADF controller PCB back to its original setting, and attach the ADF controller cover.



If A>0, slide the mount to the left.
If B>0, slide the mount to the right.

Figure 5-129

4. Adjusting the Horizontal Registration

Adjust the horizontal registration for the following:
[1] Original tray pickup
[2] Manual feeder tray pickup

a. Original Tray Pickup

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-131.

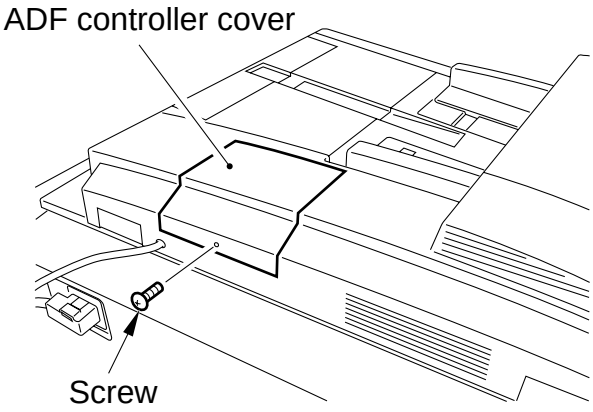


Figure 5-130

Figure 5-131

3) Place an A4 or LTR sheet of copy paper on the original tray.

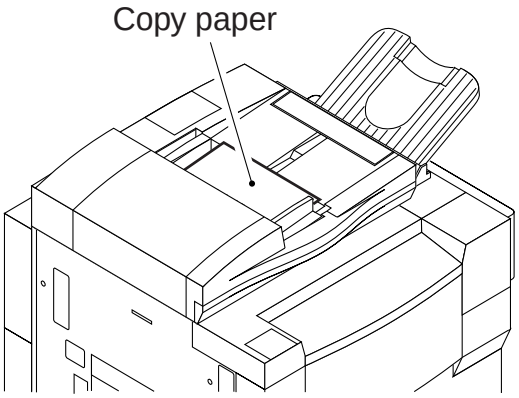


Figure 5-132

4) Press the push switch (SW2) on the ADF controller PCB once.
   - A single press on the push switch (SW2) causes the machine to pick up an original and place it on the copyboard.

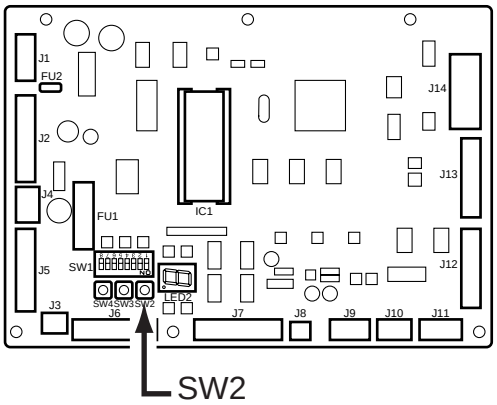


Figure 5-133

5) Open the ADF, and check to make sure that C shown in Figure 5-134 is as follows.

Original size	C measurement
A4 LTR	3.1 ± 1mm 11.9 ± 1mm

Table 5-101

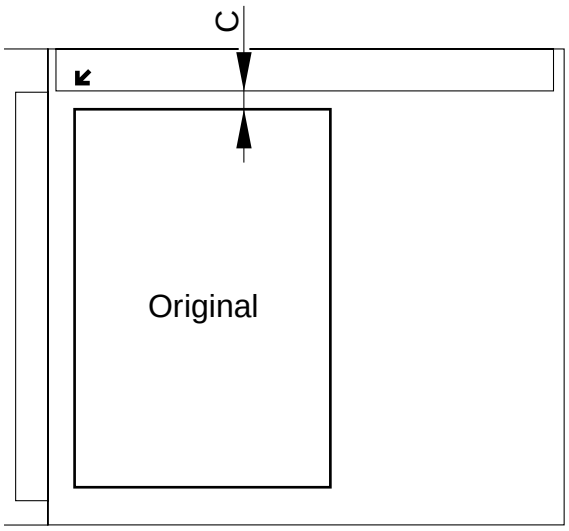


Figure 5-134

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6) Close the ADF, and press the push switch (SW2) on the ADF controller PCB once.
   • The original will be delivered to the delivery tray.

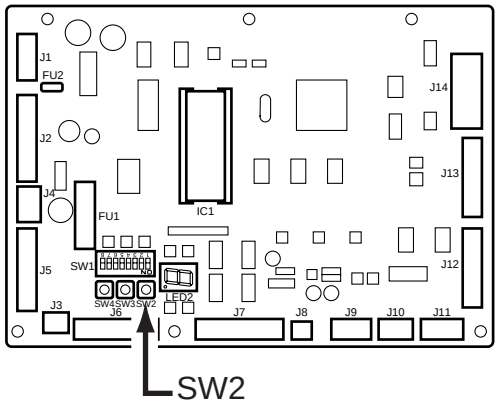
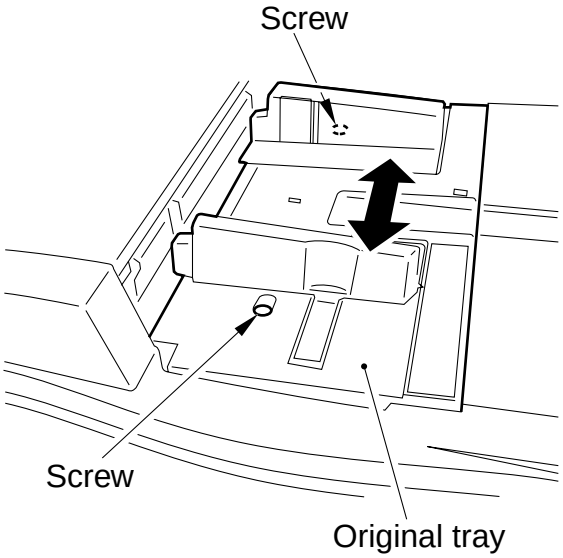


Figure 5-135

If Not as Indicated

Adjust the position of the original tray.

1) Loosen the tray fixing screw, and adjust the position of the original tray.



If C>3.1/11.9 mm, move the original tray to the rear.
If C<3.1/11.9 mm, move the original tray to the front.
(The value on the left of the slash represents A4 while that on the right, LTR.)

Figure 5-136

2) After making adjustments, tighten the original tray fixing screw.
3) Put the DIP switch (SW1) on the ADF controller PCB back to its initial setting, and mount the ADF controller cover.

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b. Manual Feeder Tray Pickup

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as indicated in Figure 5-138.

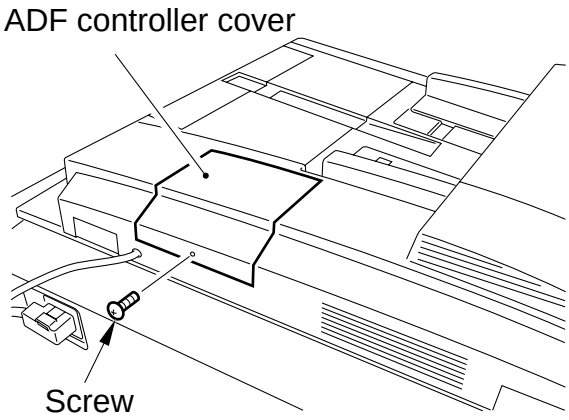

Figure 5-137

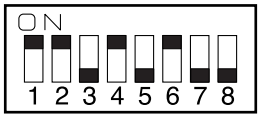

Figure 5-138

3) Open the manual feeder tray, and place an A4 or LTR sheet of copy paper.
   • Be sure to butt the copy paper against the rear.

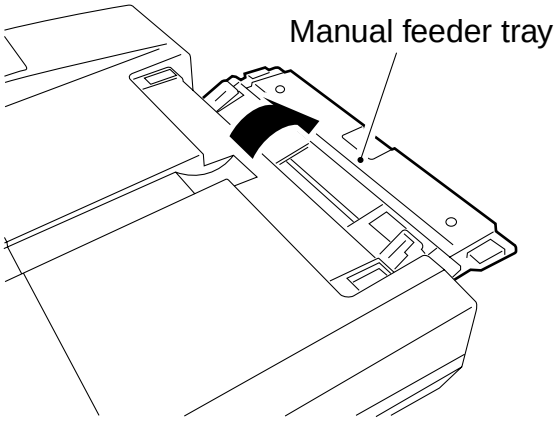

Figure 5-139

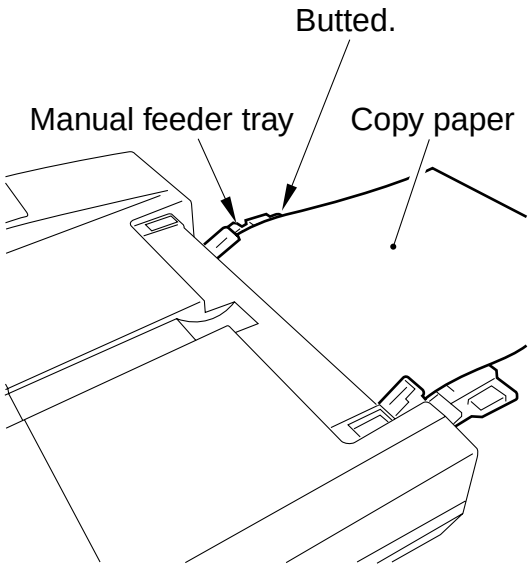

Figure 5-140

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4) Press the push switch (SW2) on the ADF controller PCB once.
   • A single press on the push switch (SW2) causes the machine to pick up an original and place it on the copyboard glass.

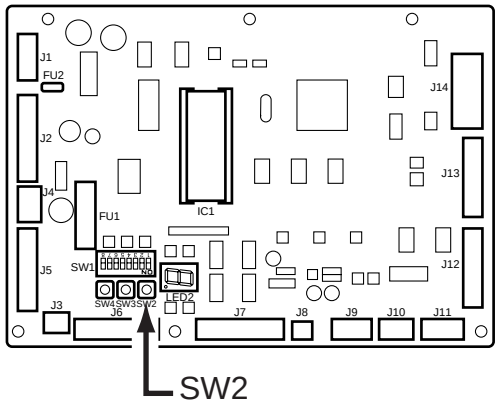


Figure 5-141

5) Open the ADF slowly, and check to make sure that C indicated in Figure 5-142 is as indicated:

Original size	C
A4 LTR	3.1 ± 1mm 11.9 ± 1mm

Table 5-102

Close the ADF, and press the push switch (SW2) on the ADF controller PCB once.
• The original will be delivered to the delivery tray.

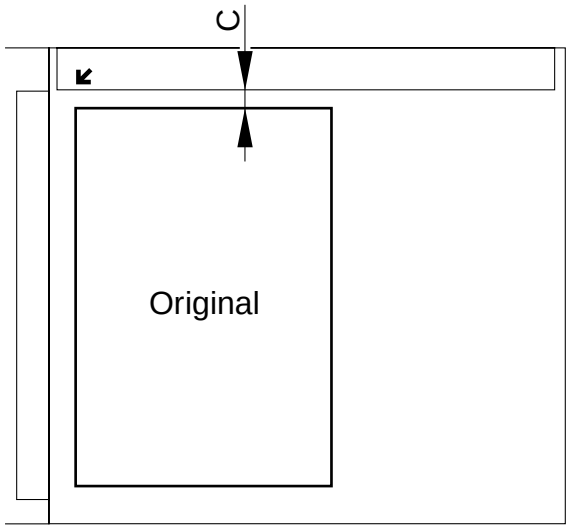
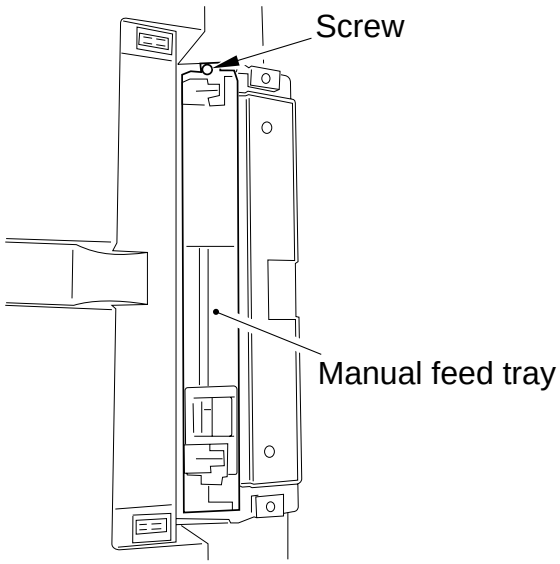


Figure 5-142

If Not as Indicated

Adjust the position of the manual feeder tray.

1) Loosen the fixing screw of the manual feeder tray, and adjust the position of the manual feeder tray.
2) After making adjustments, tighten the manual feeder tray fixing screw.
3) Put the DIP switch (SW1) on the ADF controller PCB back to its initial state, and mount the ADF controller cover.



If C > 3.1/11.9 mm, move the manual feed tray to the rear.
If C < 3.1/11.9 mm, move the manual feed tray to the front.
(The value on the left of the slash represents A4 while that on the right, LTR.)

Figure 5-143

5. Adjusting the Original Stop Position

Adjust the original stop position for the following:

[1] Original tray pickup
[2] Manual feeder tray pickup

a. Original Tray Pickup

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as indicated in Figure 5-145.

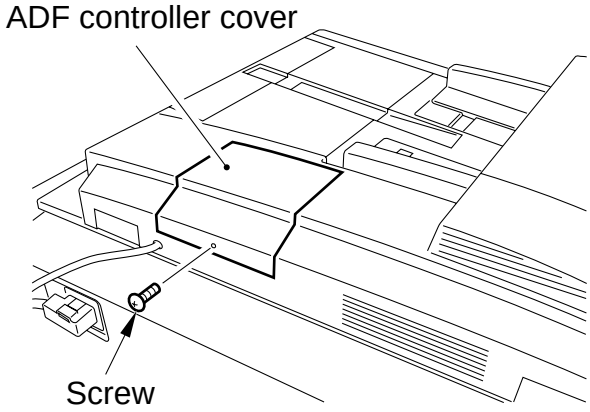


Figure 5-144

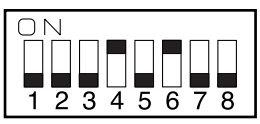


Figure 5-145

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3) Place an A4 or LTR sheet of copy paper on the original tray.

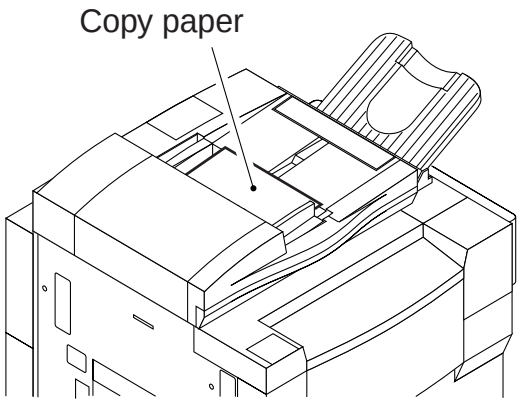

Figure 5-146

4) Press the push switch (SW2) on the ADF controller PCB once.
   - A single press on the push switch (SW2) will cause the machine to pick up an original and place it on the copyboard glass.

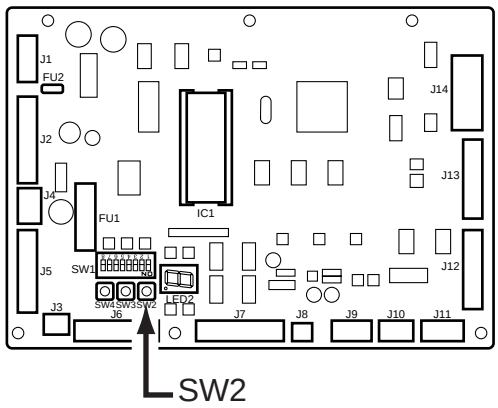

Figure 5-147

5) Open the ADF slowly, and check to make sure that D indicated in Figure 5-148 is 11 ±1 mm. Then, close the ADF slowly.

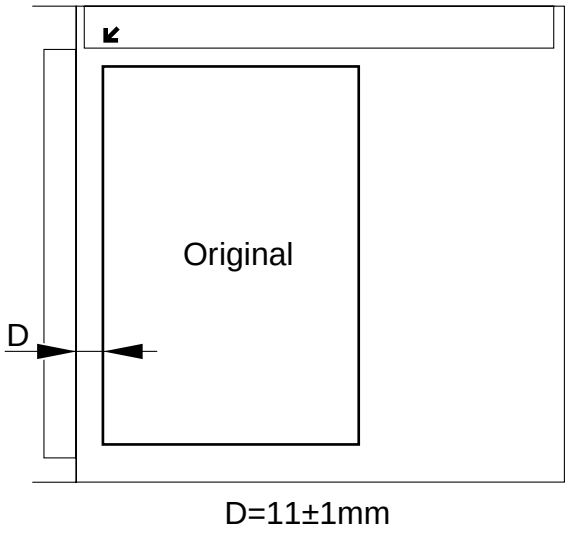

Figure 5-148

6) Adjust the original stop position using the push switches (SW3 and SW4) on the ADF controller PCB.
A press on each switch will shift the original stop position by 0.5 mm. When the stop position is correct, press the push switch (SW2).
• The original will be delivered, and the new setting will be stored.

Switch	Shift of copy paper
SW3	To the right
SW4	To the left

Table 5-103

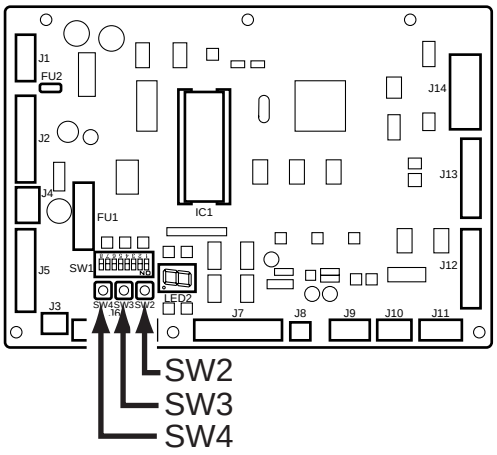

Figure 5-149

Caution:
Holding down the push switch will not bring about more than a single shift.

EX.

If the copy paper stops with a discrepancy of 12 mm,

Close the ADF leaving the copy paper on the copyboard glass.

To shift the stop position to the left by 1 mm,
1 ÷ 0.5 (adjustment increment) = 2

Hence, press the push switch SW4 twice, and then press the push switch SW2.
• The copy paper will be delivered, and the new setting will be stored .

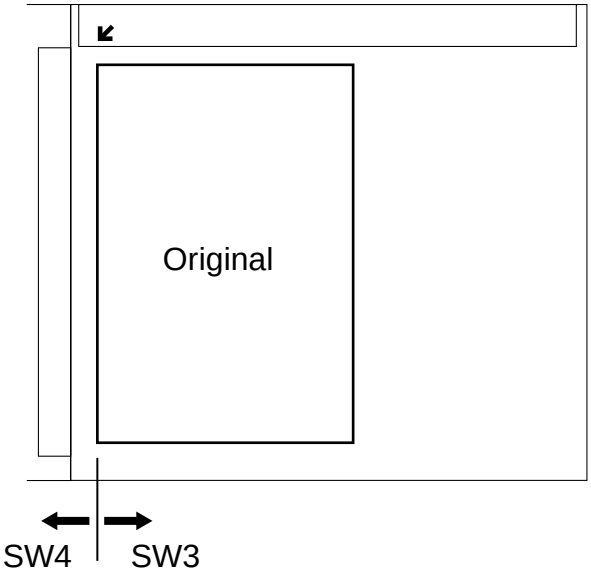

Figure 5-150

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b. Manual Feed Tray Pickup

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-152.

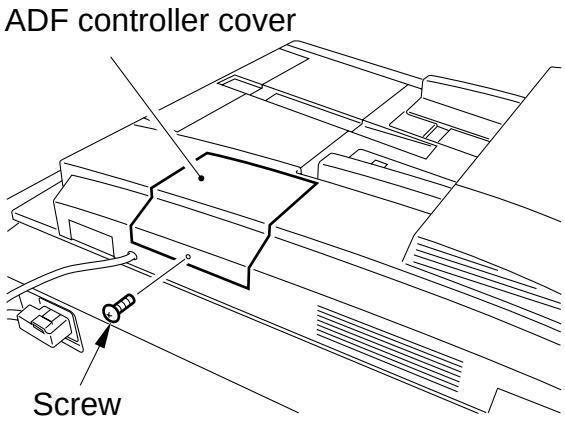

Figure 5-151

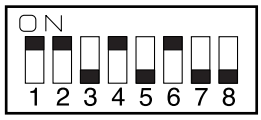

Figure 5-152

3) Open the manual feed tray, and place an A4 or LTR sheet of copy paper.
   • Be sure to butt the copy paper against the rear.

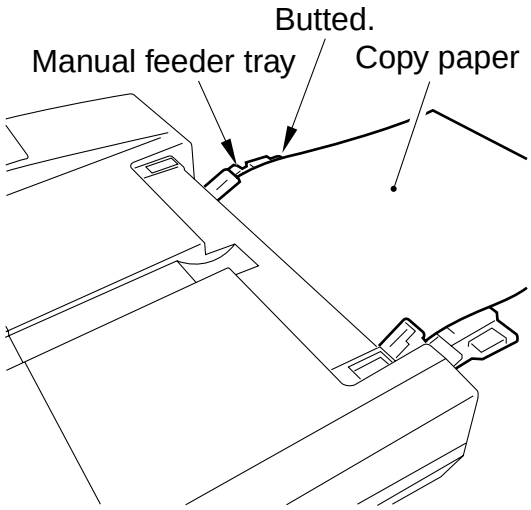

Figure 5-153

4) Press the push switch (SW2) on the ADF controller PCB once.
   • A single press will cause the machine to pick up an original and place it on the copyboard glass.

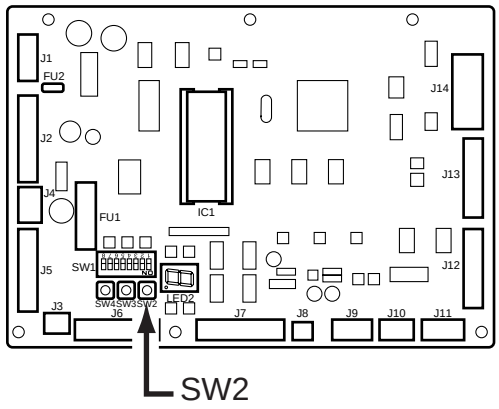

Figure 5-154

5) Open the ADF slowly, and check to make sure that D indicated in Figure 5-155 is 11 ±1 mm. Then, close the ADF slowly.

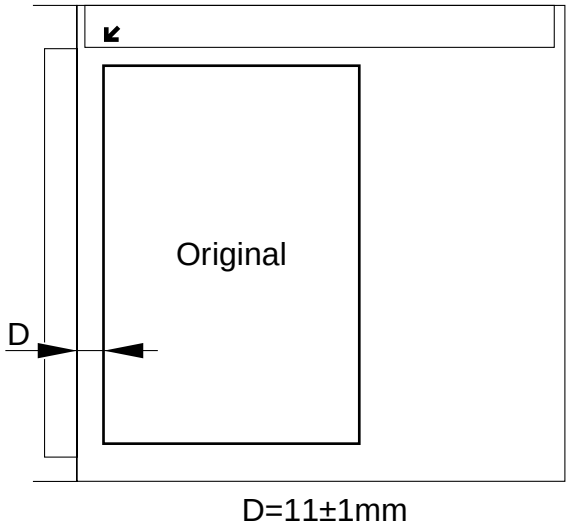

Figure 5-155

6) Adjust the original stop position using the push switches (SW 3 and SW4) on the ADF controller PCB.
A single press on each switch will shift the original stop position by 0.5 mm.
When the stop position is correct, press the push switch SW2.
• The original will be delivered, and the new setting will be stored.

Switch	Shift of copy paper
SW3	To the right
SW4	To the left

Table 5-104

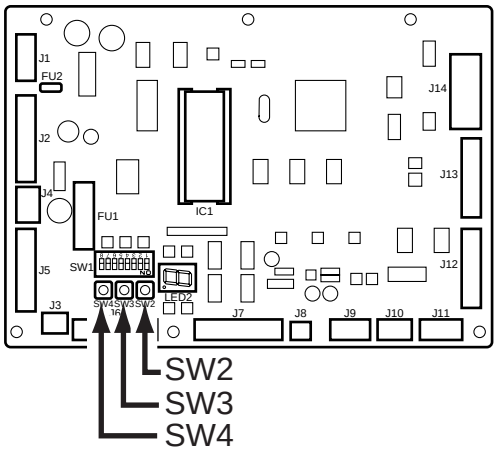

Figure 5-156

Caution:
Holding down the push switch will not bring about more than a single shift.

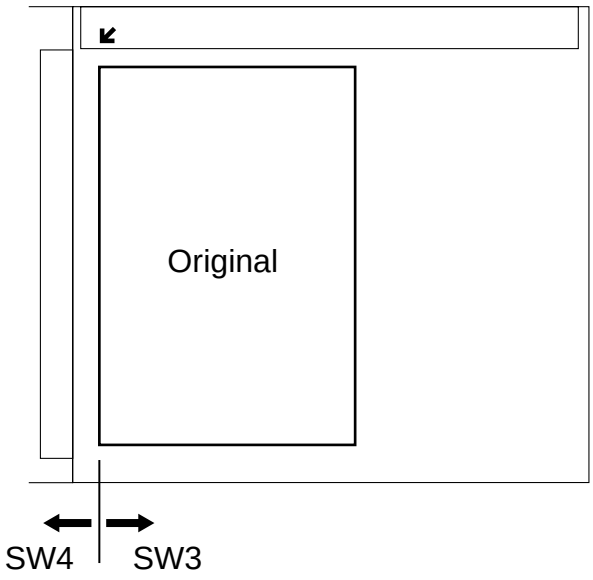

Figure 5-157

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EX.

If the original stop position has a discrepancy of 12 mm,

Close the ADF leaving the copy paper on the copyboard glass.

To shift the stop position to the left by 1 mm,

1 ÷ 0.5 (adjustment increment) = 2

Hence, press the push switch SW4 twice; then, press the push switch SW2.

- The copy paper will be delivered, and the new setting will be stored.

B. Making Adjustments When Replacing Major Parts

1. Outline

Major parts	Description	Reference
• ADF controller PCB	Replace the EEPROM.	p. 5-27
• EEPROM (memory back-up) • Reversal sensor (S1) • Pre-registration roller paper sensor (S2) • Post-registration paper sensor (S3) • Separation paper sensor (S4) • Skew paper sensor (S5) • Original sensor (S6) • Original trailing edge sensor (S7) • Pre-last original sensor (S8) • Manual feeder registration roller paper sensor (S9) • Delivery motor (M5)	Adjust sensors and delivery motor.	p. 5-28

Table 5-105

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2. Replacing the EEPROM

Perform the following when replacing the ADF controller PCB.

1) Remove the EEPROM (IC2) from the faulty ADF controller PCB.

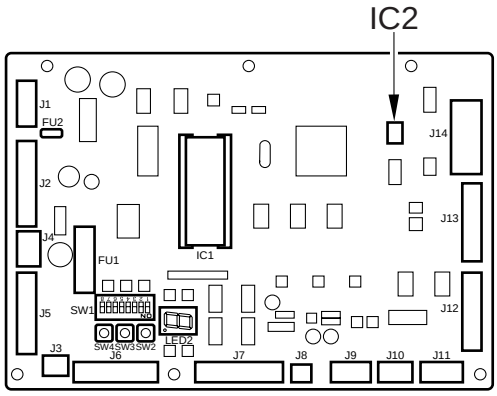

Figure 5-158

2) Mount the EEPROM removed in step 1) to the new ADF controller PCB.

Reference:

The EEPROM of the new ADF controller PCB will not be used.

3) Turn on the copier, and check to make sure that it does not indicate 'E420'.
4) If the copier indicates 'E420', mount the EEPROM removed from the new ADF controller back to the new ADF controller PCB.
5) Perform "adjusting the sensor and the delivery motor."

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3. Adjusting the Sensor and the Delivery Motor

Make this adjustment whenever you have replaced any of the following parts:

- EEPROM (memory back-up)
- Reversal sensor (S1)
- Pre-registration roller paper sensor (S2)
- Post-registration roller paper sensor (S3)
- Separation paper sensor (S4)
- Skew paper sensor (S5)
- Original sensor (S6)
- Original trailing edge sensor (S7)
- Pre-last page paper sensor (S8)
- Manual feeder registration roller paper sensor (S9)
- Delivery motor (M5)

Reference:

The delivery motor is adjusted by sending reference signals to it and checking its rotation speed by the delivery motor clock sensor (PI11). The result is used to vary the motor rotation speed control signal (EJMPWM*).

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Making Adjustments

1) Open the ADF, and make a solid black copy on A4 copy paper.
2) Remove the screw, and detach the ADF controller cover.
3) Set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-160.

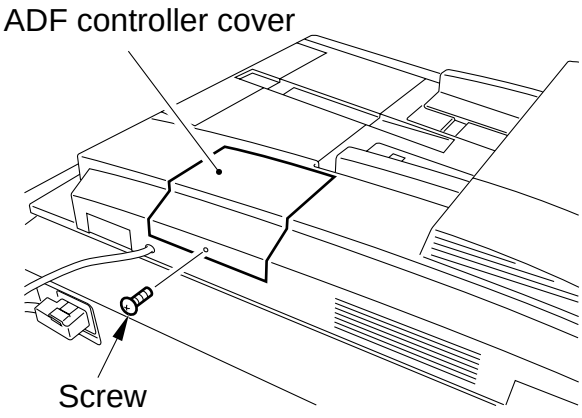

Figure 5-159

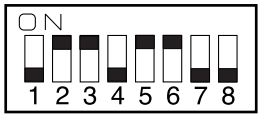

Figure 5-160

4) Place the copy made in step 1) on the original tray with its black side facing down.

Caution:
When placing the paper, take care not to block the original sensor (S6).

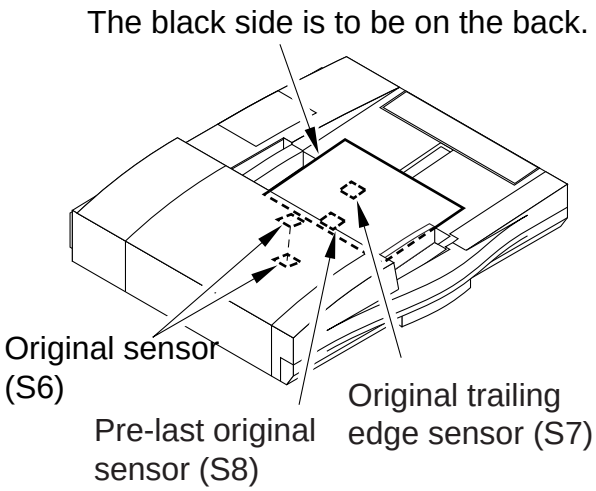

Figure 5-161

5) Press the push switch (SW2) on the ADF controller PCB.
   • The LED will indicate 1, 2, 3, 4, 5, 6, 7, 8, 9, and A in sequence, finally indicating the result.

Result	LED2	Description
OK	(0)	All sensors (S1 through S9) are good.
NG	(F)	One of the sensors (S1 through S9) is not good.

Table 5-106

6) Press the push switch (SW2) on the ADF controller PCB once again.

If the Result is Not Good

Check the state of the sensors (S1 through S9), and check and replace as necessary the faulty sensor.
The state of the sensor is indicated in three levels as follows:

State	Good	Alarm 1	Alarm 2	Faulty
LED2	(≡)	(=)	(–)	(F)
Check or replace	No	No	Yes	Yes

Table 5-107

1) If LED2 indicates NG, press the push switch SW3 or SW4 to select the sensor in question.

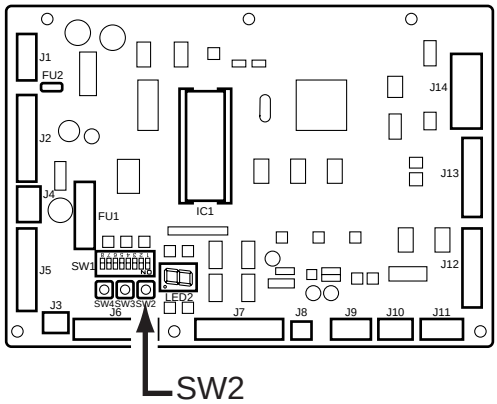

Figure 5-162

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Switch	LED2	Corresponding sensor and motor
SW3	1	Origin sensor (S6)
↓	2	Original trailing edge sensor (S7)
	3	Separation sensor (S4)
	4	Skew sensor (S5)
	5	Pre-registration roller paper sensor (S2)
	6	Post-registration roller paper sensor (S3)
	7	Reversal sensor (S1)
	8	Manual feeder registration roller paper sensor (S9)
↑	9	Pre-last original paper sensor (S8)
SW4	A	Delivery motor (M5)

Table 5-108

2) Press the push switch (SW2) on the ADF controller PCB once again.

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C. Auxiliary Adjustments

Item of adjustment	Description	Reference
Registration roller pickup arching for tray pickup	Removes the skew for CW pickup.	p. 5-32
Registration roller arching at time of reversal	Removes the skew for reversal.	p. 5-32
Registration roller pickup arching for manual feeder pickup	Removes the skew for manual feeder pickup.	p. 5-32
Feeding belt speed	Fine-adjusts the reproduction ratio for stream reading.	p. 5-34
Reversal speed	Fine-adjusts the speed of reversal.	p. 5-36
Sensor output check	Checks the presence/absence of copy paper ato a specific sensor.	p. 5-39

Table 5-109

1. Adjusting Registration Roller Pickup Arching for Tray Pickup
Adjusting Registration Roller Arching for Reversal
Adjusting Registration Roller Pickup Arching for Manual Feeder Pickup

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as shown in Table 5-110 to suit the adjustment to make:

Adjustment	Settings
Tray pickup	
Reversal	
Manual pickup	

Table 5-110

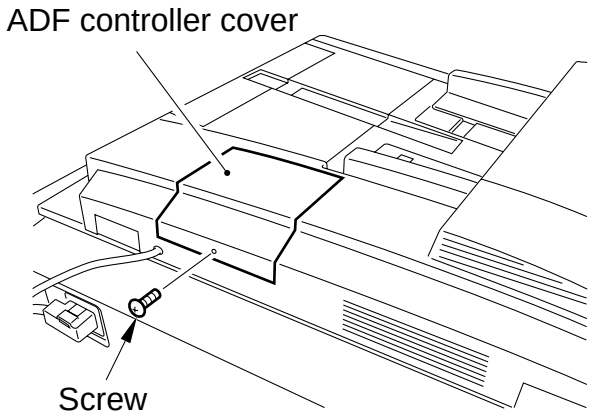

Figure 5-163

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3) Place an A4 or LTR sheet of copy paper on the original tray.

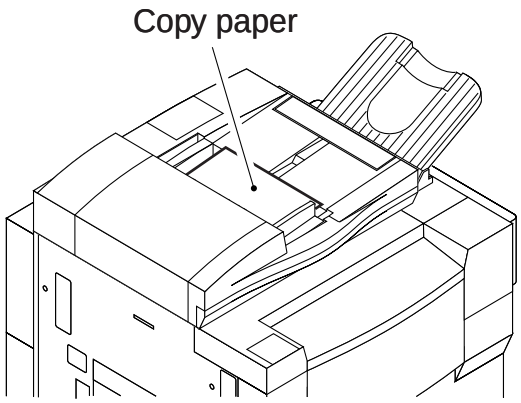

Figure 5-164

4) Press the push switch (SW2) on the ADF controller PCB.
   - The machine will pick up an original and place it on the copyboard glass.
   - LED2 will flash to indicate the present value.

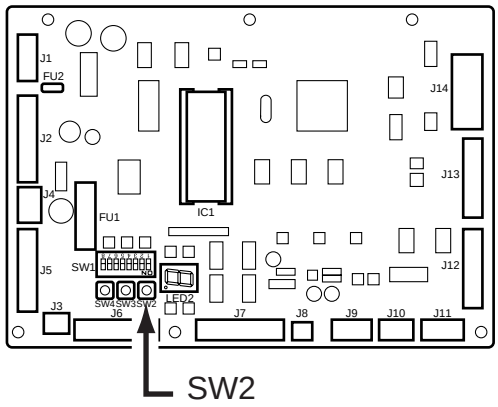

Figure 5-165

Switch	LED2 indication	Adjustment value*	Switch	LED2 indication	Adjustment value*	Switch	LED2 indication	Adjustment value*
SW3 ↓	A-E2	- 30	SW3 ↓	A-F7	- 9	SW3 ↓	A-0C	12
	A-E3	- 29		A-F8	- 8		A-0D	13
	A-E4	- 28		A-F9	- 7		A-0E	14
	A-E5	- 27		A-FA	- 6		A-0F	15
	A-E6	- 26		A-Fb	- 5		A-10	16
	A-E7	- 25		A-FC	- 4		A-11	17
	A-E8	- 24		A-Fd	- 3		A-12	17
	A-E9	- 23		A-FE	- 2		A-13	18
	A-EA	- 22		A-FF	- 1		A-14	19
	A-Eb	- 21		A-00	0 (reference value)		A-15	20
	A-EC	- 20		A-01	1		A-16	21
	A-Ed	- 19		A-02	2		A-17	22
	A-EE	- 18		A-03	3		A-18	23
	A-EF	- 17		A-04	4		A-19	24
	A-F0	- 16		A-05	5		A-1A	25
	A-F1	- 15		A-06	6		A-1b	26
	A-F2	- 14		A-07	7		A-1C	27
	A-F3	- 13		A-08	8		A-1d	28
	A-F4	- 12		A-09	9		A-1E	29
↑	A-F5	- 11	↑	A-0A	10	↑	A-1F	30
SW4	A-F6	- 10	SW4	A-0b	11	SW4	—	—

*0.1% (feeding length).

Table 5-111

5) Operate the push switch (SW3 or SW4) on the ADF controller PCB, and adjust the arching with reference to Table 5-112.

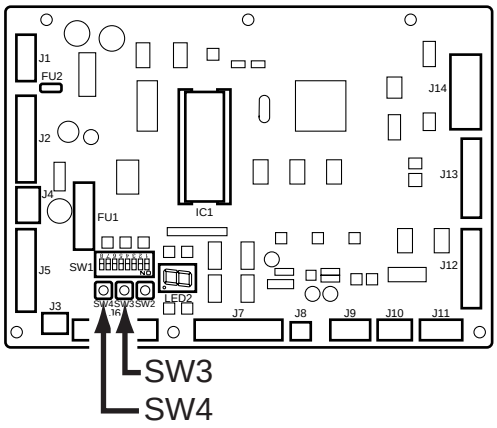

Figure 5-166

6) After making adjustments, press the push switch (SW2) on the ADF controller PCB once again.
   • The paper will be discharged, and the new setting will be stored.

Operation switch	Change
SW3	Increases the arching.
SW4	Decreases the arching.

Table 5-112

2. Adjusting the Speed of the Belt

Reference:

When the speed of the belt is adjusted, the speed of reversal will automatically be adjusted.

1) Remove the ADF cover, and set the DIP switch (SW1) on the ADF controller PCB as indicated in Figure 5-168.

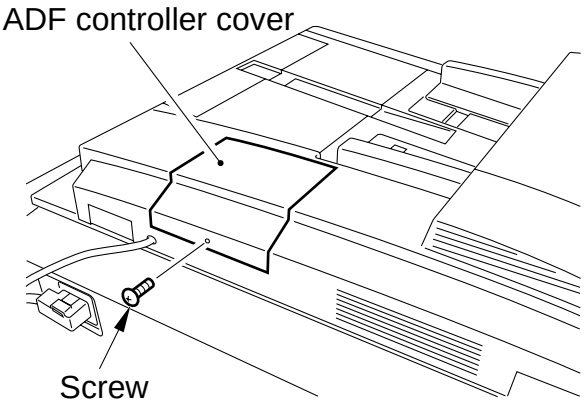

Figure 5-167

Figure 5-168

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2) Press the push switch (SW2) on the ADF controller PCB.
   • LED2 will flash to indicate the present value.

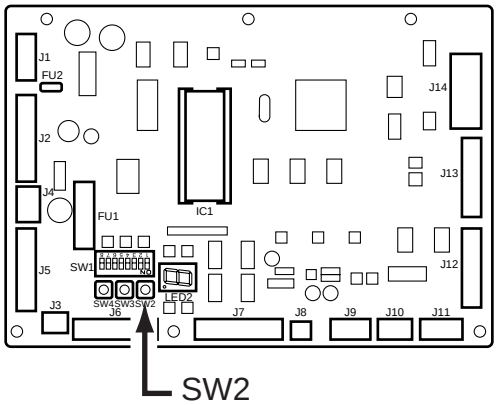

Figure 5-169

Switch	LED2 indication	Adjustment value*	Switch	LED2 indication	Adjustment value*	Switch	LED2 indication	Adjustment value*
SW3	A-E2	- 30	SW3	A-F7	- 9	SW3	A-0C	12
↓	A-E3	- 29	↓	A-F8	- 8	↓	A-0D	13
	A-E4	- 28		A-F9	- 7		A-0E	14
	A-E5	- 27		A-FA	- 6		A-0F	15
	A-E6	- 26		A-Fb	- 5		A-10	16
	A-E7	- 25		A-FC	- 4		A-11	17
	A-E8	- 24		A-Fd	- 3		A-12	17
	A-E9	- 23		A-FE	- 2		A-13	18
	A-EA	- 22		A-FF	- 1		A-14	19
	A-Eb	- 21		A-00	0 (reference value)		A-15	20
	A-EC	- 20		A-01	1		A-16	21
	A-Ed	- 19		A-02	2		A-17	22
	A-EE	- 18		A-03	3		A-18	23
	A-EF	- 17		A-04	4		A-19	24
	A-F0	- 16		A-05	5		A-1A	25
	A-F1	- 15		A-06	6		A-1b	26
	A-F2	- 14		A-07	7		A-1C	27
	A-F3	- 13		A-08	8		A-1d	28
	A-F4	- 12		A-09	9		A-1E	29
↑	A-F5	- 11	↑	A-0A	10	↑	A-1F	30
SW4	A-F6	- 10	SW4	A-0b	11	SW4	—	—

*0.1% (reproduction ratio).

Table 5-113

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3) Operate the push switch (SW3 or SW4) on the ADF controller PCB, and adjust the speed of the belt with reference to Table 5-114.

Switch	Change
SW3	Increases the speed, reducing the image.
SW4	Decreases the speed, enlarging the image.

Table 5-114

4) After making adjustments, press the push switch (SW2) on the ADF controller PCB once again.

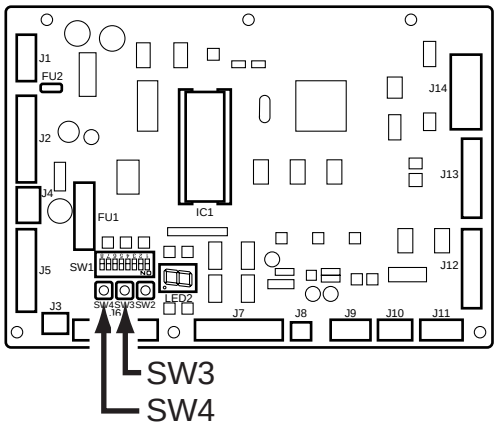

Figure 5-170

3. Adjusting the Speed of Reversal

1) Remove the ADF cover, and set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-172.

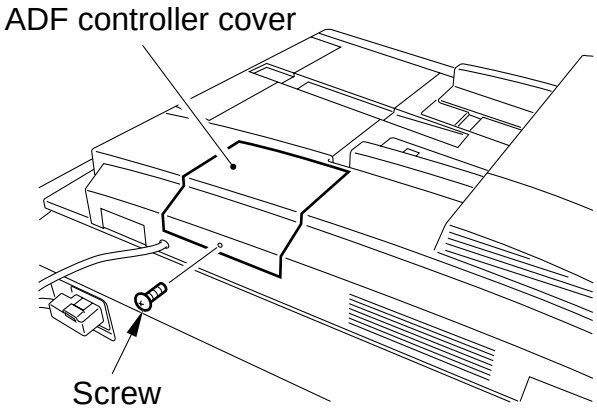

Figure 5-171

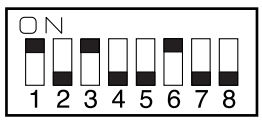

Figure 5-172

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2) Press the push switch (SW2) on the ADF controller PCB.
   • LED2 will flash to indicate the present value.

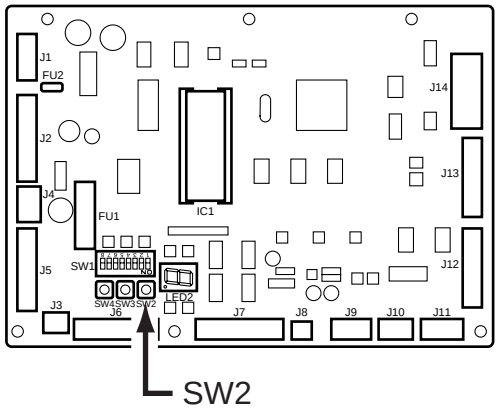

Figure 5-173

Switch	LED2 indication	Adjustment value*	Switch	LED2 indication	Adjustment value*	Switch	LED2 indication	Adjustment value*
SW3 ↓	A-E2	- 30	SW3 ↓	A-F7	- 9	SW3 ↓	A-0C	12
	A-E3	- 29		A-F8	- 8		A-0D	13
	A-E4	- 28		A-F9	- 7		A-0E	14
	A-E5	- 27		A-FA	- 6		A-0F	15
	A-E6	- 26		A-Fb	- 5		A-10	16
	A-E7	- 25		A-FC	- 4		A-11	17
	A-E8	- 24		A-Fd	- 3		A-12	17
	A-E9	- 23		A-FE	- 2		A-13	18
	A-EA	- 22		A-FF	- 1		A-14	19
	A-Eb	- 21		A-00	0 (reference value)		A-15	20
	A-EC	- 20		A-01	1		A-16	21
	A-Ed	- 19		A-02	2		A-17	22
	A-EE	- 18		A-03	3		A-18	23
	A-EF	- 17		A-04	4		A-19	24
	A-F0	- 16		A-05	5		A-1A	25
	A-F1	- 15		A-06	6		A-1b	26
	A-F2	- 14		A-07	7		A-1C	27
	A-F3	- 13		A-08	8		A-1d	28
	A-F4	- 12		A-09	9		A-1E	29
↑	A-F5	- 11	↑	A-0A	10	↑	A-1F	30
SW4	A-F6	- 10	SW4	A-0b	11	SW4	—	—

*0.1% (rotation speed of the reversal motor).

Table 5-115

3) Operate the push switch (SW3 or SW4) on the ADF controller PCB, and adjust the speed of reversal with reference to Table 5-116.

Switch	Change
SW3	Increases the speed of rotation.
SW4	Decreases the speed of rotation.

Table 5-116

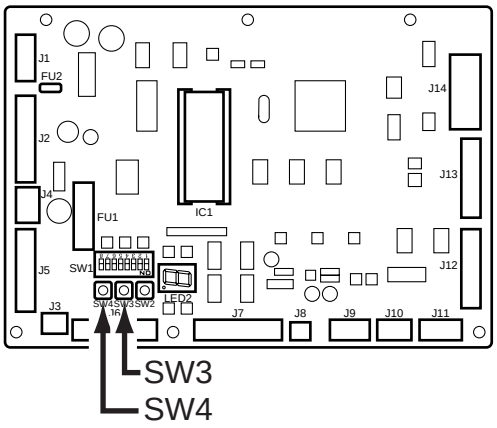

Figure 5-174

4) After making adjustments, press the push switch (SW2) on the ADF controller PCB once again.

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4. Checking the Sensor Output

You may check the presence/absence of copy paper using the 7-segment LED (LED2) on the ADF controller PCB.

LED2 indication	Corresponding sensor (notation)
1 (1)	Original sensor (S6)
2 (2)	Original trailing edge sensor (S7)
3 (3)	Separation sensor (S4)
4 (4)	Skew sensor (S5)
5 (5)	Pre-registration roller paper sensor (S2)
6 (6)	Post-registration roller paper sensor (S3)

LED2 indication	Corresponding sensor (notation)
7 (7)	Reversal sensor (S1)
8 (8)	Manual feeder registration roller paper sensor (S9)
9 (9)	Pre-last original paper sensor (S8)
A (A)	Pre-reversal sensor (PI4)
b (b)	Original delivery sensor (PI13)
C (C)	Manual feeder sensor (PI12)

Table 5-117

1) Remove the ADF controller cover, and set the DIP switch (SW1) on the ADF controller PCB as indicated in Figure 5-176 (normal operation mode).

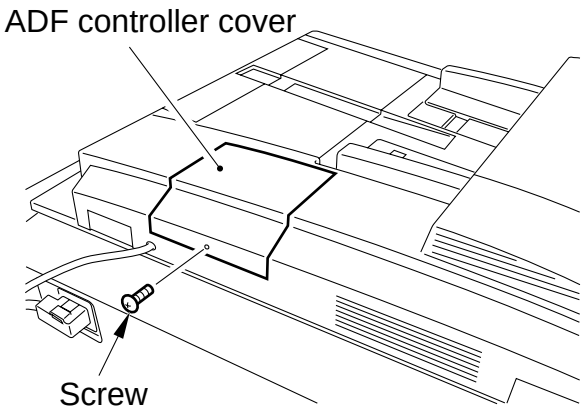

Figure 5-175

Figure 5-176

2) Press the push switch (SW2) once.
   • The 7-segment LED (LED2) on the ADF controller PCB will start to flash for '1', indicating that the sensor operation diagnosis function has turned on.

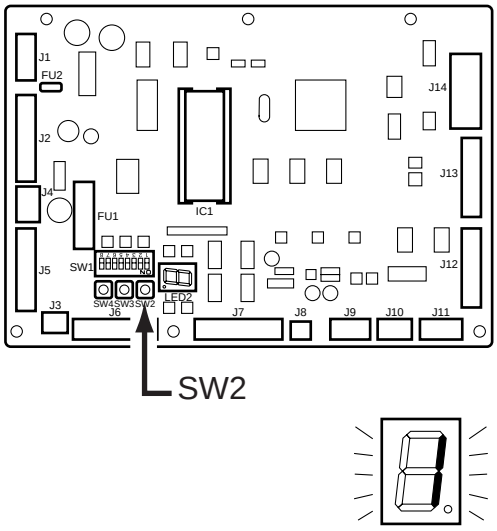

Figure 5-177

3) Operate the push switch SW3 or SW4 to change the indication of the 7-segment LED (LED2), thereby checking the presence/absence of paper over a specific sensor. (See also Table 5-117.)

LED2 indication	Copy paper
ON	Present
Flashing	Absent

Table 5-118

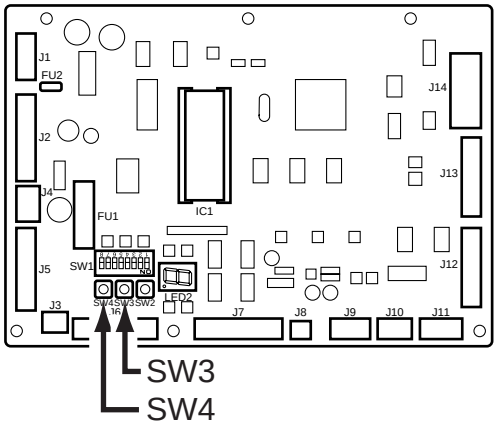

Figure 5-178

4) To end a check, press the push switch (SW2) once.
   • LED2 indication will change to indicate normal operation.

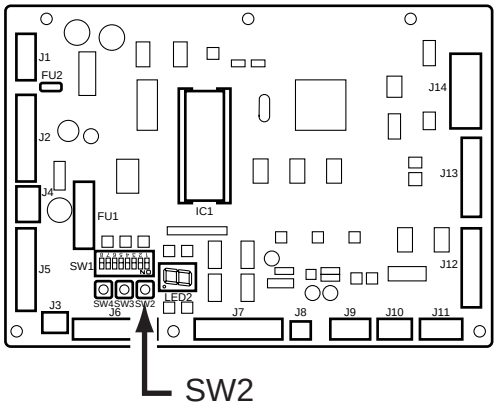

Figure 5-179

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D. Indication

Item of indication	Description	Reference
Jam counter	Indicates the number of jams.	p. 5-41
Tray pickup counter	Indicates the number of pickups made from the tray according to the sizes of originals (small or large).	p. 5-42
Manual feeder pickup counter	Indicates the number of pickups made from the manual feeder according to the sizes of originals (small or large).	p. 5-42
Jam history	Indicates the most recent three jams.	p. 5-43
Software version	Indicates the version of software.	p. 5-44

Table 5-119

1. Jam Counter

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as indicated in Figure 5-180.

Figure 5-180

3) Press the push switch (SW2) on the ADF controller PCB.

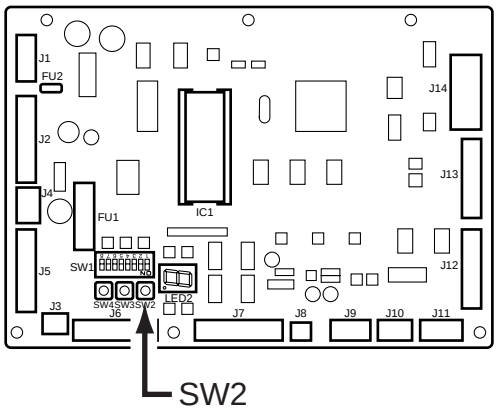


Figure 5-181

4) Find out how LED2 is flashing.
   • The LED can express up to 65,000.
5) After making adjustments, press the push switch (SW2) on the ADF controller PCB once again.

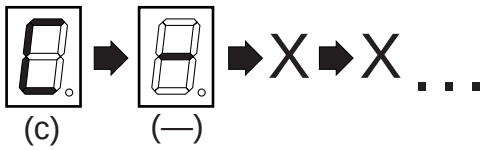


Figure 5-182

2. Tray Pickup Counter/Manual Feeder Pickup Counter

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as indicated in Table 5-120.

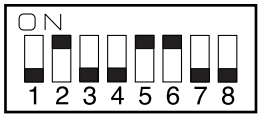
Item	Settings
Tray pickup counter	
Manual feeder pickup counter	

Table 5-120

3) Press the push switch (SW2) on the ADF controller PCB.
   • LED2 will flash to indicate the total number of pickups.

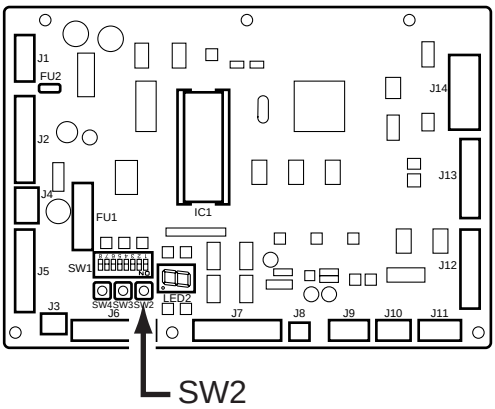


Figure 5-183

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4) Operate the push switch (SW3 or SW4) on the ADF controller PCB to switch the indication.

Switch	Indication	Description
SW3 ↓	A-XXXX	Total number
	S-XXXX	Small-size number
↑ SW4	L-XXXX	Large-size number

Table 5-121

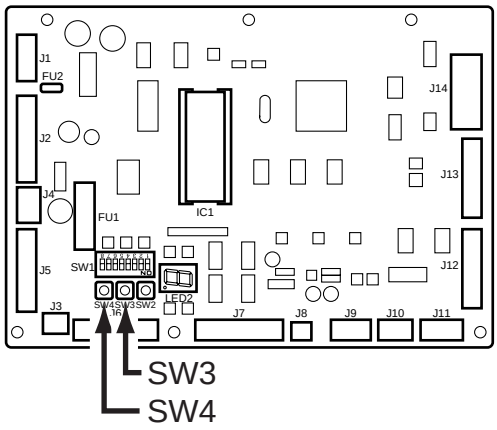


Figure 5-184

Reference:

- The total number may be up to 4,800,000.
- The small-size and large-size number may be up to 2,400,000.
- In the case of tray pickup, the 1's place is rounded off at power-off.

5) After making adjustments, press the push switch (SW2) on the ADF controller PCB once again.

3. Jam History

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-185.

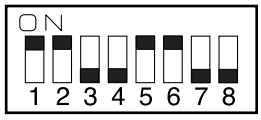


Figure 5-185

3) Press the push switch (SW2) on the ADF controller PCB.
   - LED2 will indicate the most recent jam code.

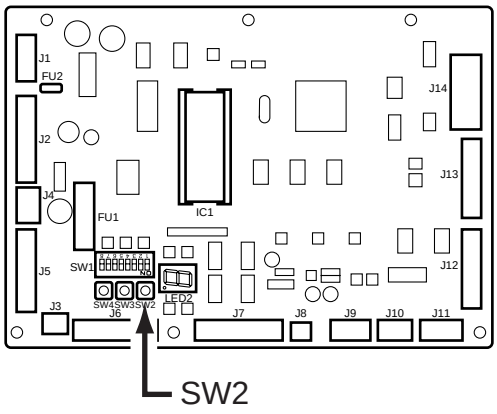


Figure 5-186

4) Operate the push switches (SW3 and SW4) to switch the LED2 indication, thereby checking the jam history.
   • LED2 will flash five times to indicate the nature of the jam.

Switch	LED2	Description
SW3 ↓	1-X1-X2-Y1-Y2	Most recent jam
	2-X1-X2-Y1-Y2	Second most recent jam
↑ SW4	3-X1-X2-Y1-Y2	Third most recent jam

X1, X2 : Jam code.
Y1, Y2 : Not used.

Table 5-122

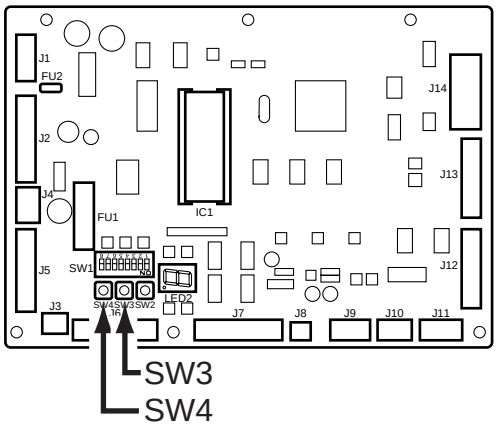


Figure 5-187

5) After making adjustments, press the push switch (SW2) on the ADF controller PCB.

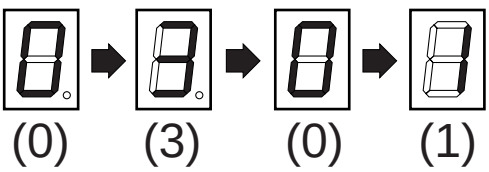
4. Software Version

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller as shown in Figure 5-188.

Figure 5-188

3) Press the push switch (SW2) on the ADF controller PCB.
   • LED2 will flash four times to indicate the software version.

EX.
In the case of version 3.01,



4) Press the push switch (SW2) on the ADF controller PCB to find out the version of the software.

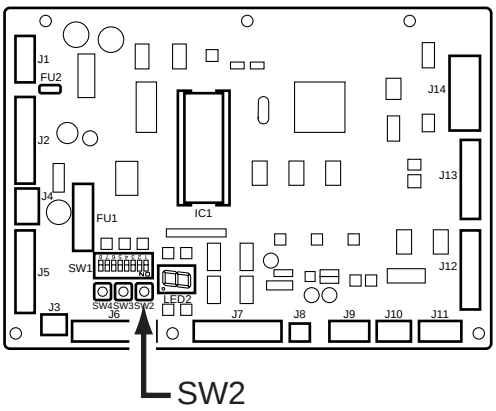


Figure 5-189

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E. Cleaning

Item	Description	Reference
Separation assembly	Clean the separation assembly using copy paper and alcohol.	p. 5-45
Registration roller (tray pickup)	1. If dirt is limited, Execute automatic cleaning of the registration roller (pickup from tray). 2. If dirt is excessive, Clean the registration roller using lint-free paper and alcohol.	p. 5-47 p. 5-47

Table 5-123

1. Cleaning the Separation Assembly

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-190.

Figure 5-190

3) Press the push switch (SW2) on the ADF controller PCB.

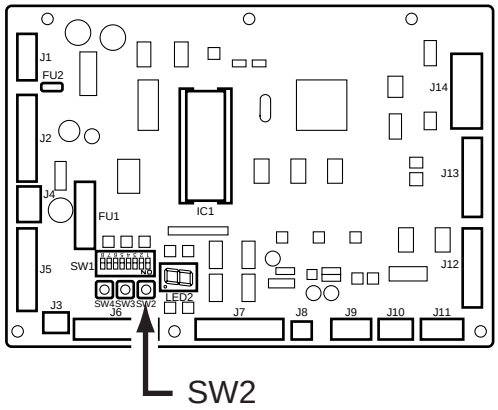

Figure 5-191

4) Moisten copy paper with alcohol, and feed it into the separation assembly while holding tightly onto its trailing edge.

Caution:
Be sure to hold the trailing edge of the copy paper as shown.

5) Press the push switch (SW2) on the ADF controller PCB once again to end the operation.

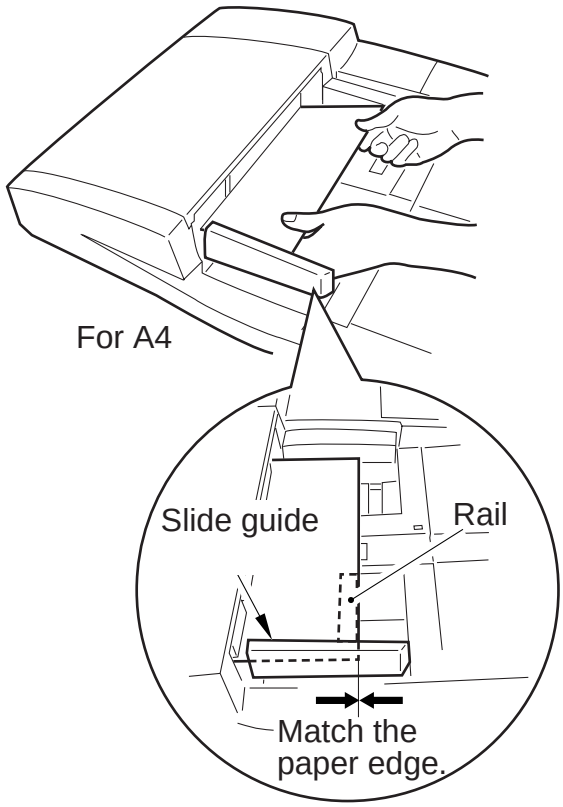

Figure 5-192a

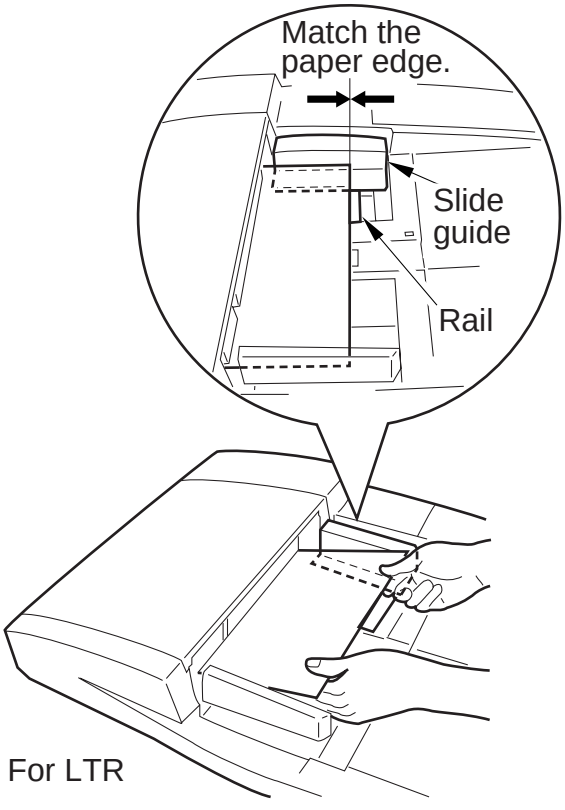

Figure 5-192b

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2. Cleaning the Registration Roller

• If the dirt is limited,

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-193.
3) Place about ten sheets of copy paper on the tray.

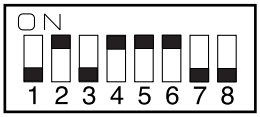

Figure 5-193

4) Press the push switch (SW2) on the ADF controller PCB to end the operation.

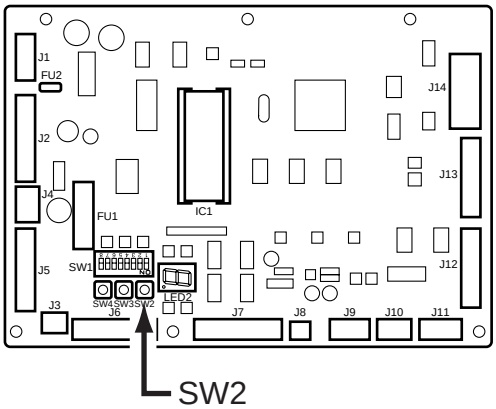

Figure 5-194

• If the dirt is excessive,

1) Open the upper cover, and open the feeding guide.
2) Remove the two screws, and detach the reversing guide.

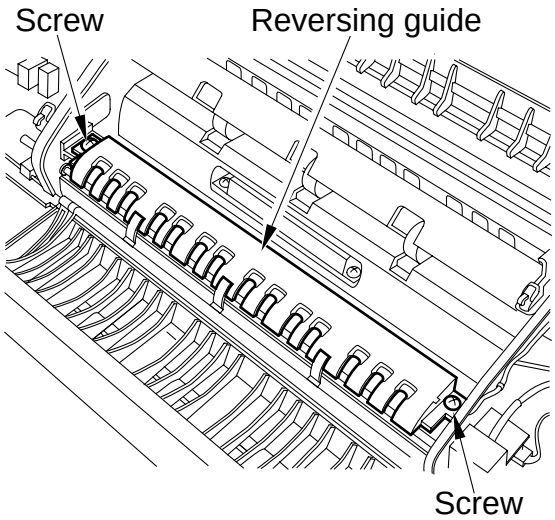

Figure 5-195

3) Remove the ADF controller cover, and set the DIP switch (SW1) on the ADF controller PCB as shown.

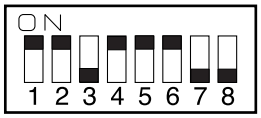

Figure 5-196

4) Press the push switch (SW2) on the ADF controller PCB.
   • The reversing assembly starts to operate.

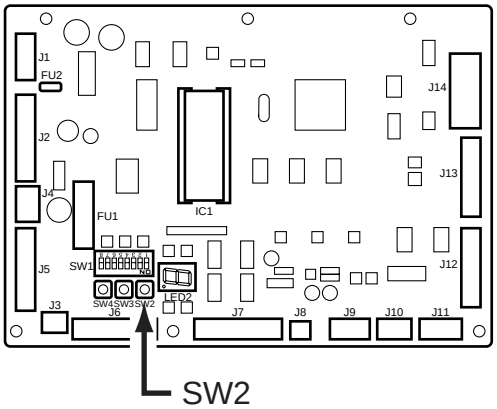

Figure 5-197

5) Clean with lint-free paper moistened with alcohol.

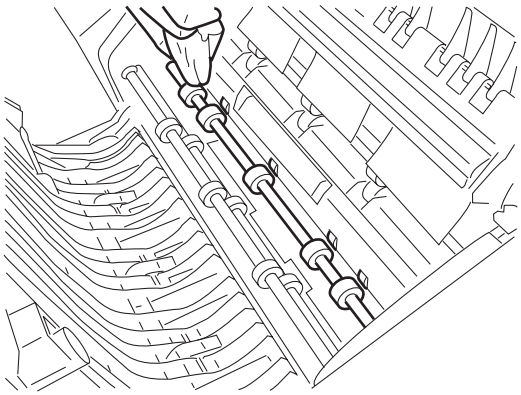

Figure 5-198

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F. Others

Item	Description	Reference
Original width detecting switch (SW301) check	Executes an automatic check on the original width detecting switch (SW301).	p. 5-49
Back-up RAM clear	Initializes the back-up RAM.	p. 5-50
Setting mixed paper configuration mode	Sets mix size mode for originals of different configurations.	p. 5-51

Table 5-124

1. Checking the Original Width Detecting Switch (SW301)

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as shown in Figure 5-199.

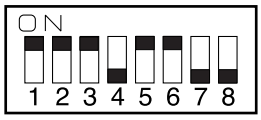

Figure 5-199

3) Press the push switch (SW2) on the ADF controller PCB.
   • LED2 turns on or flashes to indicate the present original width each time the position of the side guide is changed.

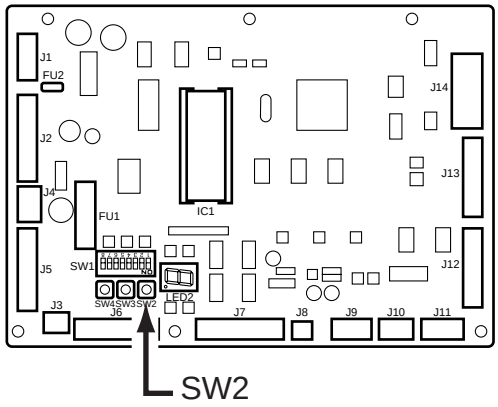

Figure 5-200

LED2 indication		Default size	LED2 indication		Default size
0	ON Flashing	A4 Non-default	8	ON Flashing	B5R Non-default
1	ON Flashing	LTR Non-default	9	ON Flashing	STM Non-default
2	ON Flashing	B4 Non-default	A	ON Flashing	B4 Non-default
3	ON Flashing	LTR Non-default	b	ON Flashing	STMT Non-default
4	ON Flashing	A4 Non-default	C	ON Flashing	A5 Non-default
5	ON Flashing	Error* Error	d	ON Flashing	A5 Non-default
6	ON Flashing	Error Error	E	ON Flashing	Error* Error
7	ON Flashing	Error* Error	F	ON Flashing	Error* Error

*The original detecting switch (SW301) may be faulty.

Table 5-125

4) Press the push switch (SW2) on the ADF controller PCB once again to end the operation.

2. Initializing the Back-Up RAM

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) on the ADF controller PCB as indicated in Figure 5-201.

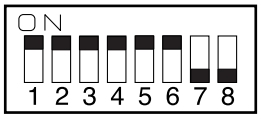

Figure 5-201

3) Press the push switch (SW2) on the ADF controller PCB to end the operation. (The operation will end immediately.)

Reference:

The counter data (jam, tray pickup, manual feeder pickup) cannot be initialized.

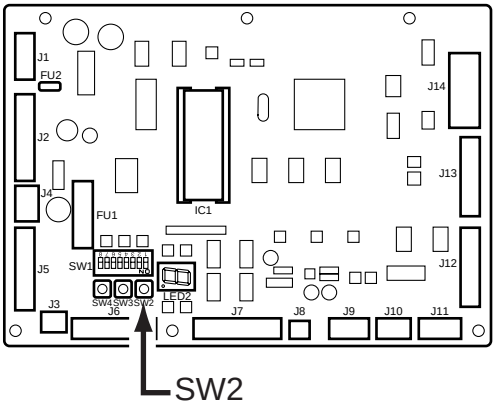

Figure 5-202

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3. Setting Mix Size Mode

- To use this mode, the pickup roller arrangement must be changed and the DIP switch must be set in advance.

a. Changing the Pickup Roller Arrangement

1) Open the left cover, and remove the inside cover.

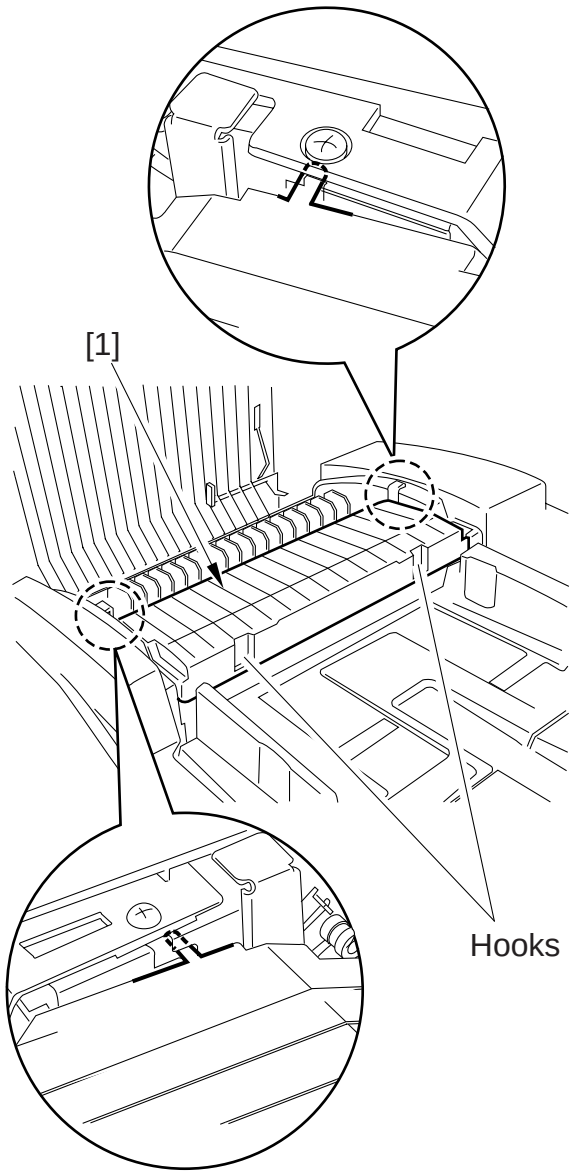

Figure 5-203

2) Remove the screws, and detach the pickup guide A, pickup guide B, and original sensor mount.

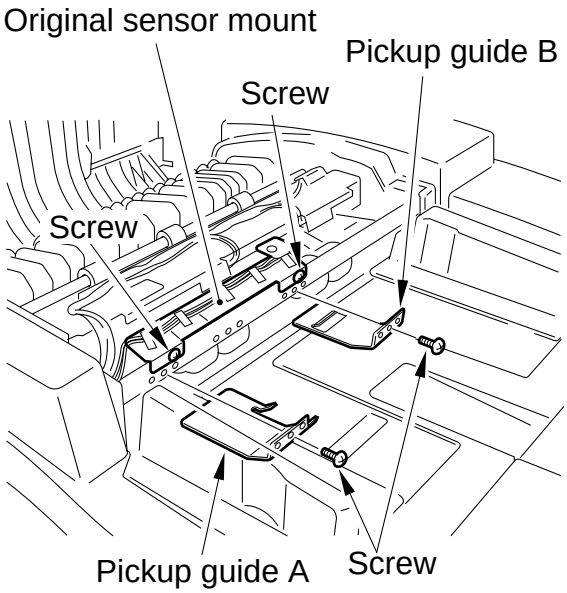

Figure 5-204

3) Remove the E-ring, and remove the pickup roller (rear, front).

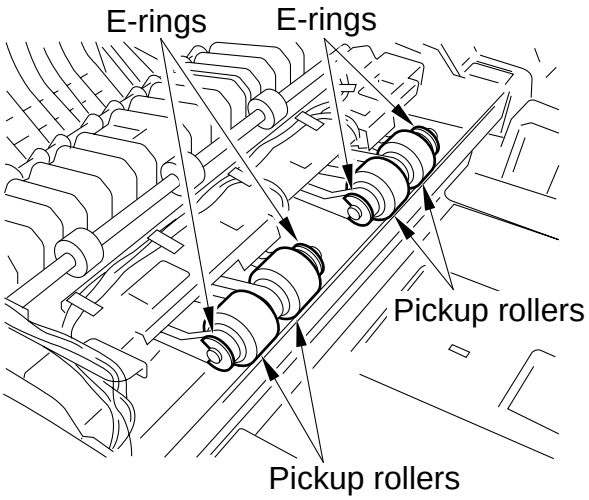

Figure 5-205

4) Connect the shaft of the pickup roller.

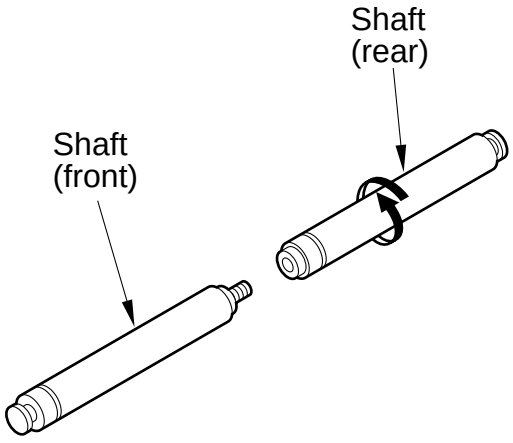

Figure 5-206

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5) Remove the rubber roller (1 pc.) from the pickup roller.

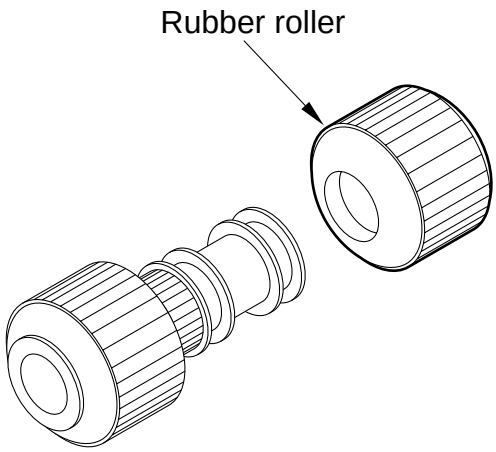

Figure 5-207

6) Cut the front of the three pickup rollers with a cutter, and remove them.

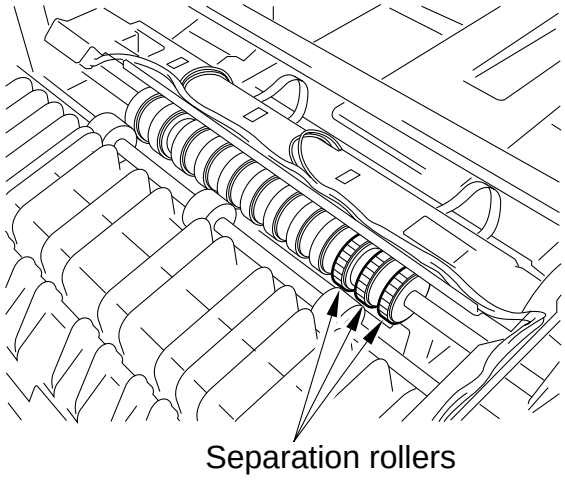

Figure 5-208

7) Move the timing belt from the front to the center.

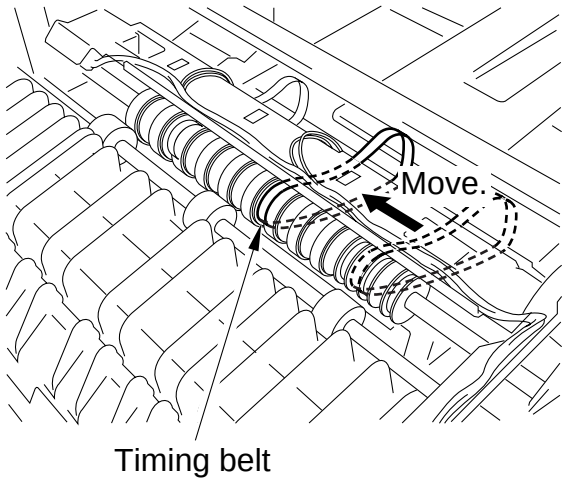

Figure 5-209

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8) Remove the two pickup roller arms at the front, and mount the front arm to the rear. (No roller will be used at the rear.)

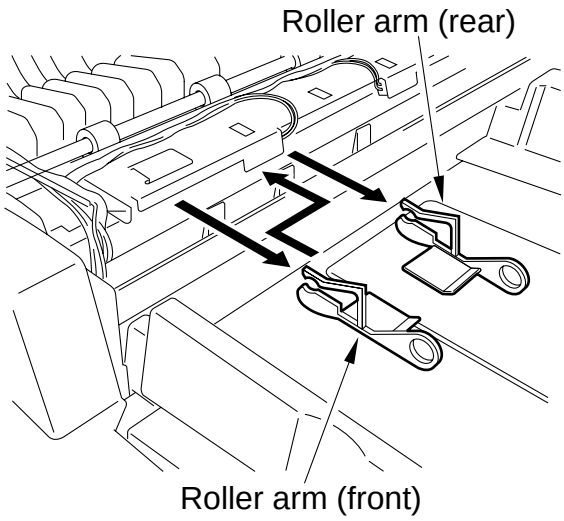

Figure 5-210

9) Attach the timing belt on the pickup roller; arranging two rollers, slide the shaft through them, and secure them in place with E-rings.

Caution:
Be sure that the shaft is centered.

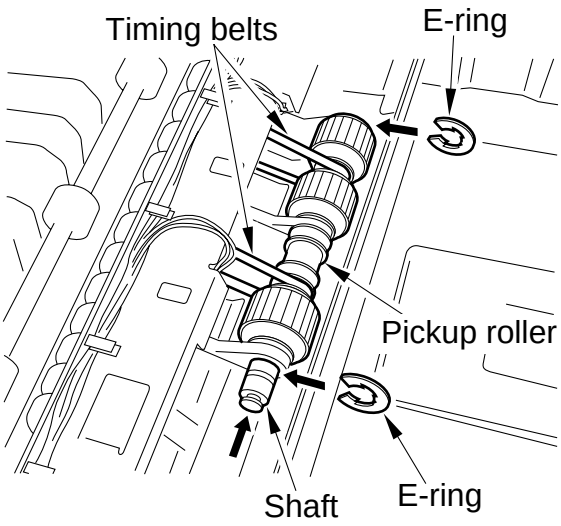

Figure 5-211

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10) Mount the two pickup guides and the original sensor mount.

Caution:
Keep in mind that the position of the pickup guide B is different from that of the original machine.

11) Mount the inside cover.

Reference:
Parts that should remain:
Rubber roller .... 1 pc.
Feeding roller ... 3 pc.
E-ring ..... 2 pc.
Roller arm ..... 1 pc.

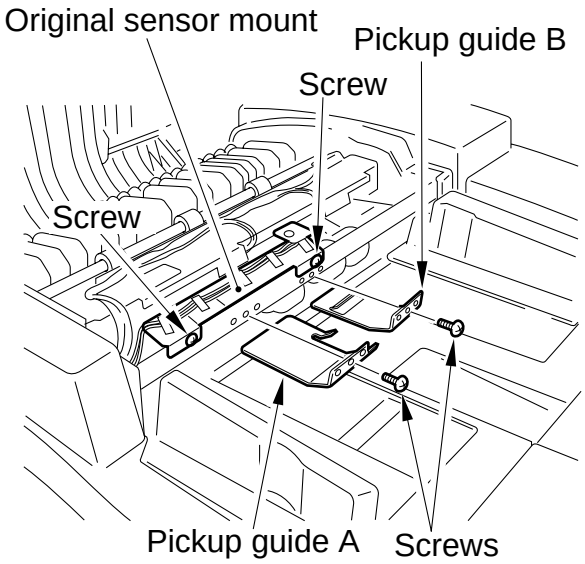

Figure 5-212

b. Operating the DIP Switch

1) Remove the screw, and detach the ADF controller cover.
2) Set the DIP switch (SW1) as shown in Figure 5-213.

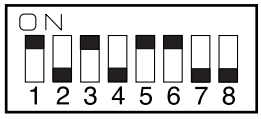

Figure 5-213

3) Press the push switch (SW2) on the ADF controller PCB.

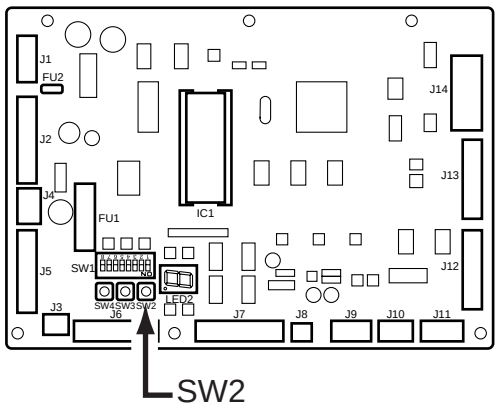

Figure 5-214

4) Press the push switch SW3 or SW4 on the ADF controller PCB five times or more in succession to switch the setting.
Refer to LED2 to find out the stored setting.

Switch	LED2 indication	Mix size mode
SW3	1	Enable.
SW4	0	Disable.

Table 5-126

5) Press the push switch (SW2) on the ADF controller PCB to end the operation.

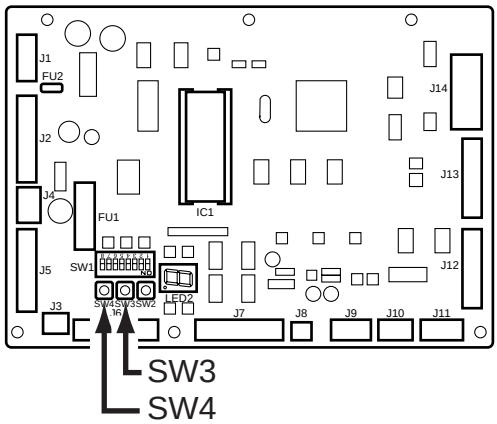

Figure 5-215

c. Operation

1) Put the originals against the rear.

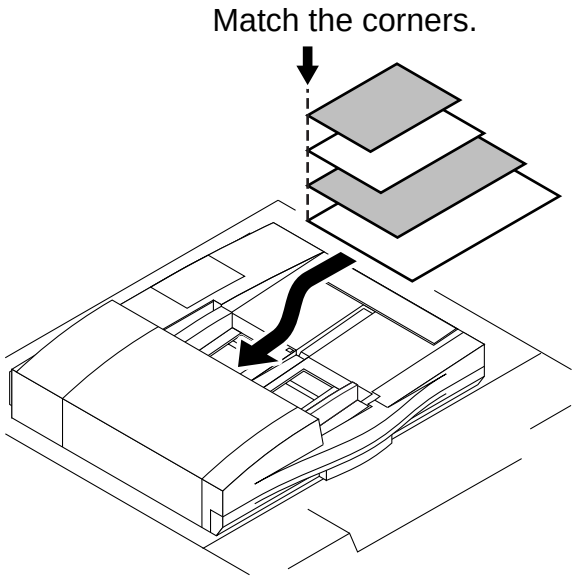

Figure 5-216

2) Place the originals on the original tray, and adjust the slide guide to the largest original.
3) Select Extension Mode > Mix Size on the copier's control panel.
4) Press the Copy Start key.

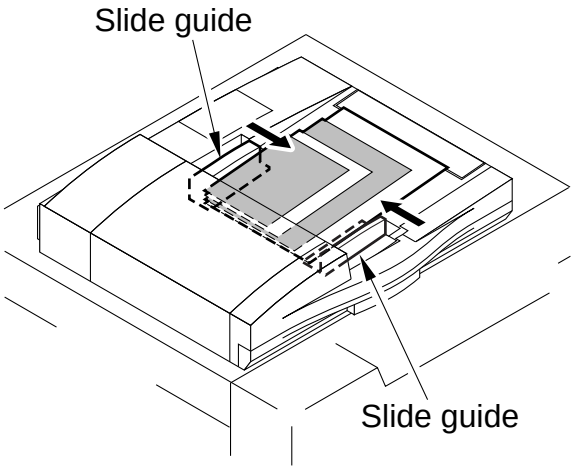

Figure 5-217

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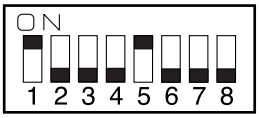
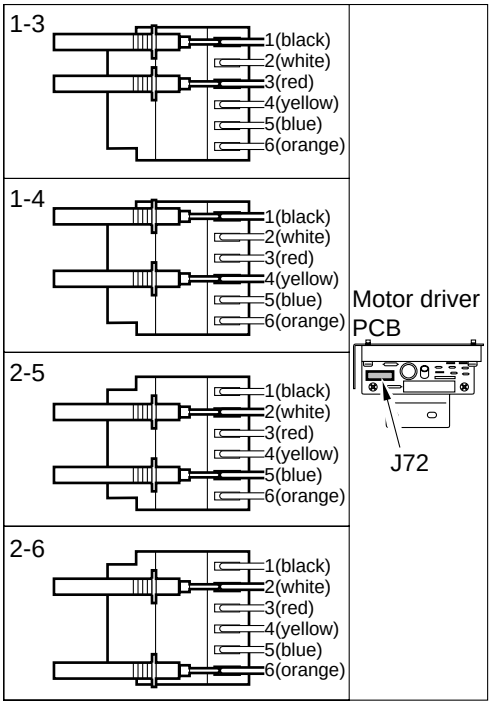
II . TROUBLESHOOTING

A. Troubleshooting Malfunctions

1	E402

Cause	Step	Checks	Yes/No	Action
	1	Set the DIP switch (SW1) on the ADF controller PCB as follows:  Press the push switch (SW2). Does the belt motor (M2) rotate? (To stop, press the push switch (SW2) once again.)	YES	Go to step 3.
Belt motor (M2)	2	Disconnect the connector (J72) on the belt motor driver PCB. Set the meter range to × 1Ω, and connect the meter probes as indicated. Is the resistance about 1.1Ω for each? 	NO	Replace the belt motor (M2).

Cause	Step	Checks	Yes/No	Action
Belt motor clock sensor (PI1)	1	Set the meter range to 10 VDC. Turn the belt motor by hand. Does the voltage between J12-3 (+) and J12-2 (-) on the ADF controller PCB change between 0V and 5 V?	NO	Replace the belt motor clock sensor (PI1).
Cable	2	Is the cable between the belt motor driver PCB and the ADF controller PCB connected properly?	NO	Connect the cable correctly.
Belt motor driver PCB	3	Replace the belt motor driver PCB. Is the problem corrected?	YES	Replace the belt motor driver PCB.
ADF controller PCB			NO	Replace the ADF controller PCB.

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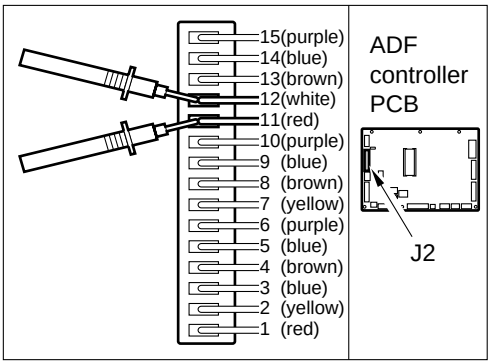
2	E404

Cause	Step	Checks	Yes/No	Action
	1	Set the DIP switch (SW1) on the ADF controller PCB as indicated. Press the push switch (SW2). Does the delivery motor (M5) rotate? (To stop, press the push switch (SW2) once again.)	YES	Go to step 3.
Delivery motor (M5)	2	Disconnect the connector (J2) from the ADF controller PCB. Set the meter range to × 1Ω, and connect the meter probes as indicated. Is the resistance about 15Ω?  	NO	Replace the delivery motor (M5). After replacement, be sure to perform "Adjusting the Sensor and the Delivery Motor."
Delivery Motor Clock Sensor (PI11)	3	Set the meter range to 10 VDC. Turn the delivery motor by hand. Does the voltage between connectors J3-2 (+) and J3-1 (-) on the ADF controller PCB change between 0 V and 5 V?	NO	Replace the delivery motor clock sensor (PI11).
ADF controller PCB			YES	Replace the ADF controller PCB.

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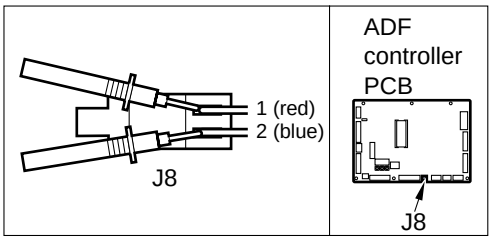
3	E405

Cause	Step	Checks	Yes/No	Action
	1	Set the DIP switch (SW1) on the ADF controller PCB as follows: Press the push switch (SW2). Does the separation motor rotate?	YES	Go to step 3.
Separation motor (M4)	2	Disconnect the connector (J8) of the ADF controller PCB. Set the meter range to × 1Ω, and connect the connector as indicated. Is the resistance about 5.0Ω? 	NO	Replace the separation motor (M4).
Separation motor clock sensor (PI2)	3	Set the meter range to 10 VDC. Rotate the separation motor by hand. Is the voltage between connectors J12-5 (+) and J12-4 (-) on the ADF controller PCB change between 0 V and 5 V?	NO	Replace the separation motor clock sensor (PI2).
ADF controller PCB			YES	Replace the ADF controller PCB.

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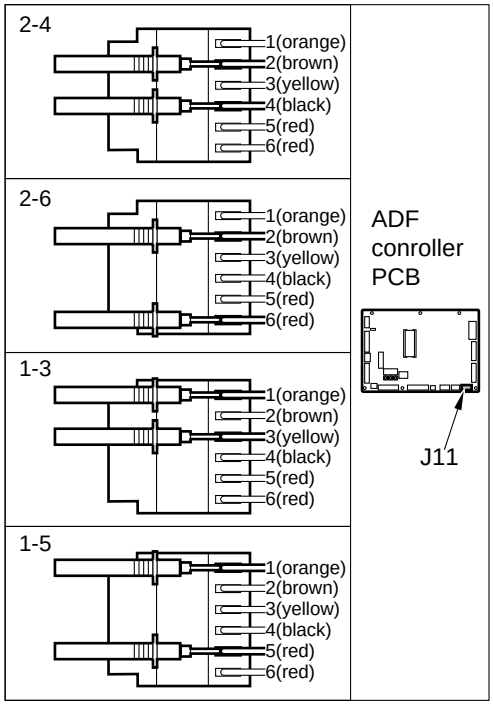
4	E410

Cause	Step	Checks	Yes/No	Action
	1	Set the DIP switch (SW1) on the ADF controller PCB as indicated. Press the push switch (SW2) and press the push switch (SW3/SW4). Does the motor (M3) rotate? (To stop, press the push switch (SW2) once again.)	YES	Go to step 3.
Pickup motor (M3)	2	Disconnect the connector (J11) of the ADF controller PCB. Set the meter range to × 1Ω, and connect the meter probes as indicated. Is the resistance about 74Ω for each? 	NO	Replace the pickup motor (M3).

Cause	Step	Checks	Yes/No	Action
Pickup roller height sensor 1 (PI8)	3	Set the meter range to 10 VDC. Move the pickup roller unit (rear) up and down by hand. Does the voltage between connectors J14-A8 (+) and J14-A7 (-) on the ADF controller PCB change between 0 V and 5 V?	NO	Replace the pickup roller height sensor 1 (PI8).
Pickup roller height sensor 2 (PI9)	4	Set the meter range to 10 VDC. Move the pickup roller unit (font) up and down by hand. Does the voltage between J14-A11 (+) and J14-A10 on the ADF controller PCB alternate between 0 and 5 V?	NO	Replace the pickup roller height sensor 2 (PI9).
Pickup roller home position sensor (P7)	5	Set the meter range to 10 VDC. Move the pickup roller unit (front) up and down by hand. Is the voltage between J14-A5 (+) and J14-A4 (-) on the ADF controller PCB about 5 V?	NO	Replace the pickup roller home position sensor (PI7).
ADF controller PCB	6	Replace the ADF controller PCB. Is the problem corrected?	YES	Replace the ADF controller PCB.

5 E422

Cause	Step	Checks	Yes/No	Action
Communication cable	1	Is the communication cable between the machine and the copier connected properly?	NO	Connect the cable properly.
Connector	2	Is the connector (J1) on the ADF controller PCB connected properly?	NO	Connect the connector properly.
Cable	3	Is the cable from the connector (J1) of the ADF controller PCB to the communication cable normal?	NO	Replace the cable.
ADF controller PCB			YES	Replace the ADF controller PCB.

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III . ARRANGEMENT OF ELECTRICAL PARTS

A. Sensors

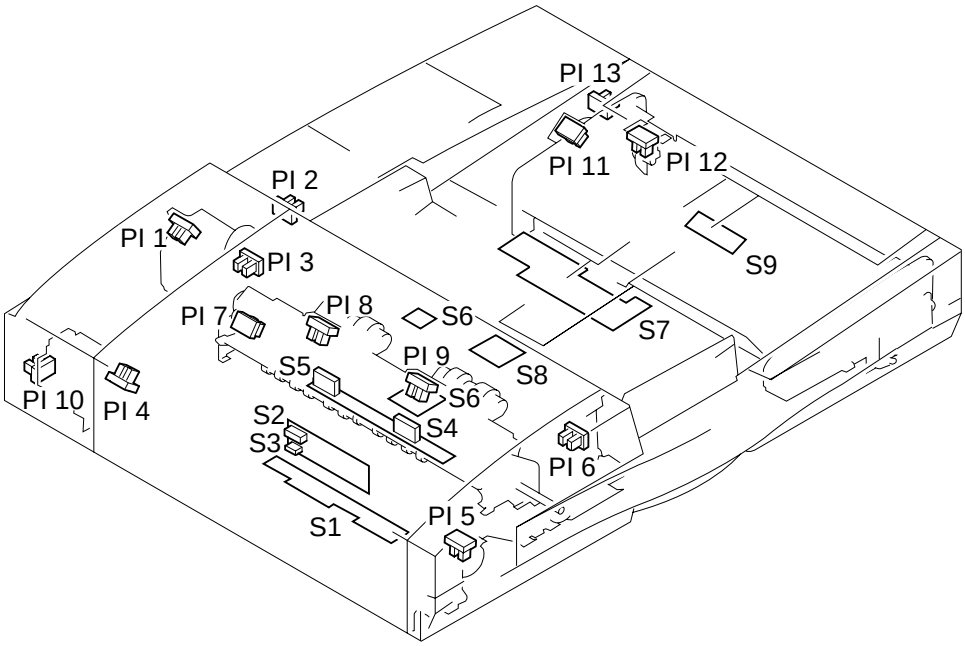


Figure 5-301

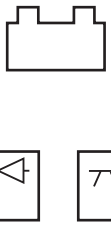
Symbol	Name	Notation	Description
	Photointerrupter	PI1 PI2 PI3 PI4 PI5 PI6 PI7 PI8 PI9 PI10 PI11 PI12 PI13	Belt motor clock detection Separation motor clock detection Left cover open/closed detection (rear) Pre-reversal paper detection Registration roller rotation detection Left cover open/closed detection (front) Pickup roller home position detection Pickup roller height detection 1 Pickup roller height detection 2 ADF open/closed detection Delivery motor clock detection Manual feeder set detection Original delivery detection
	Reflecting type sensor	S1 S2 S3 S4 S5 S6 S7 S8 S9	Reversing assembly paper detection Pre-registration roller paper detection Post-registration roller paper detection Separation paper detection Skew paper detection Original detection Original trailing edge detection Pre-last original paper detection Manual feeder registration roller paper detection

Table 5-301

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B. Motors, Clutches, and Solenoids

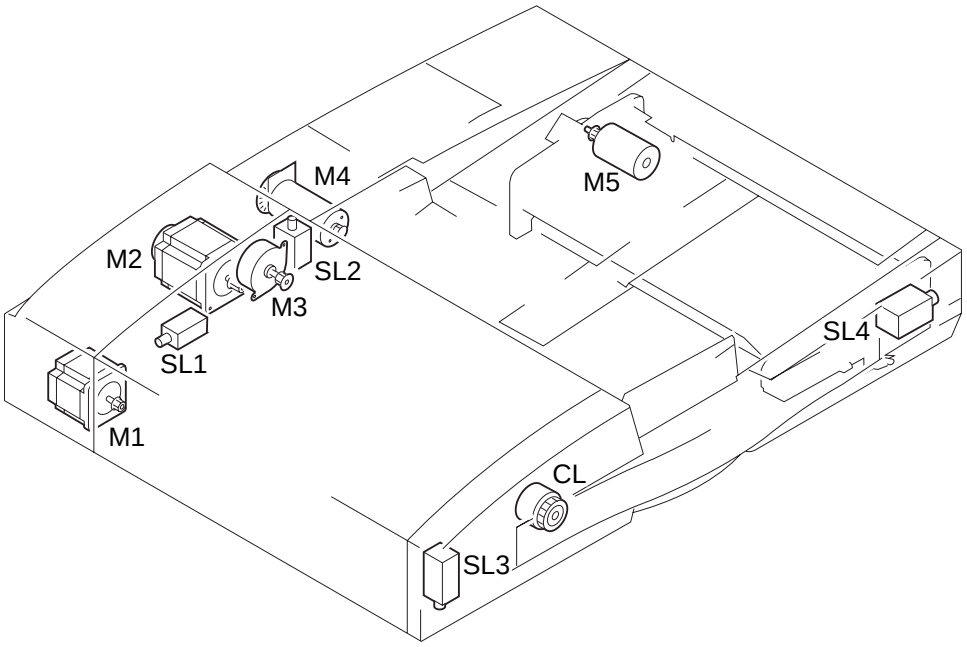

Figure 5-302

Symbol	Name	Notation	Function
M	Motor	M1 M2 M3 M4 M5	Reversal motor Belt motor Pickup motor Separation motor Delivery motor
CL	Clutch	CL	Separation clutch
SL	Solenoid	SL1 SL2 SL3 SL4	Reversing solenoid Stopper plate solenoid Pre-reversal solenoid Delivery solenoid

Table 5-302

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C. PCBs

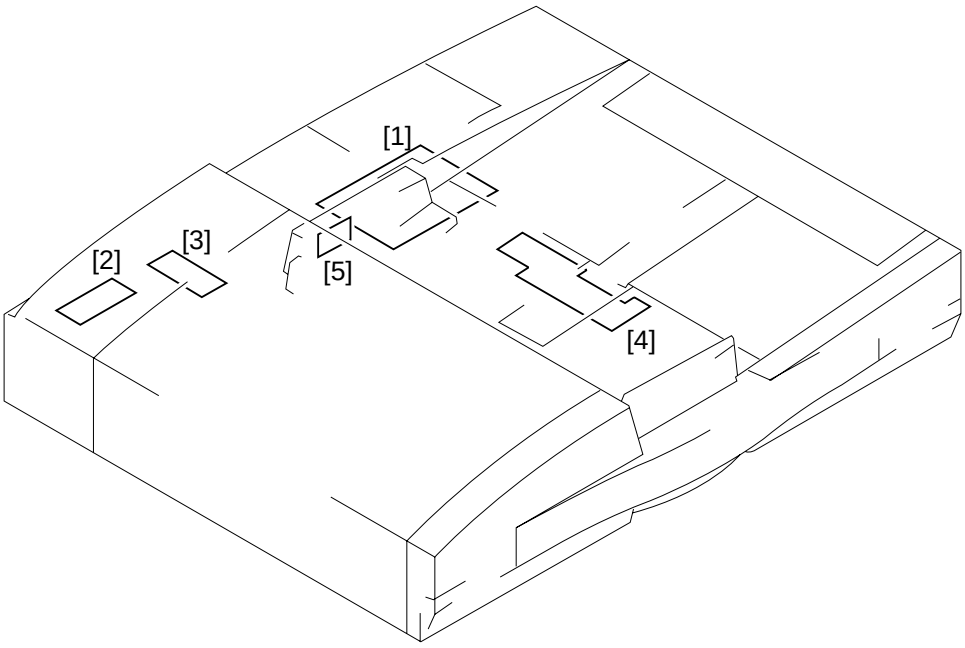

Table 5-303

Ref.	Name
1	ADF controller PCB
2	Reversal motor driver PCB
3	Belt motor driver PCB
4	Pickup tray PCB
5	Indicator LED PCB

Figure 5-303

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IV . LEDS, CHECK PINS, AND SWITCHES BY PCB

Of the LEDs and check pins, those needed in the field are discussed.

Caution:
Do not touch the check pins not found herein. They are for the factory only, and require special tools/instruments, and must be adjusted to high accuracy.

A. ADF Conroller PCB

Caution:
Some LEDs emit dim light when they are off because of leakage current. This is a normal condition and must be kept in mind.

1. Arrangement of Parts

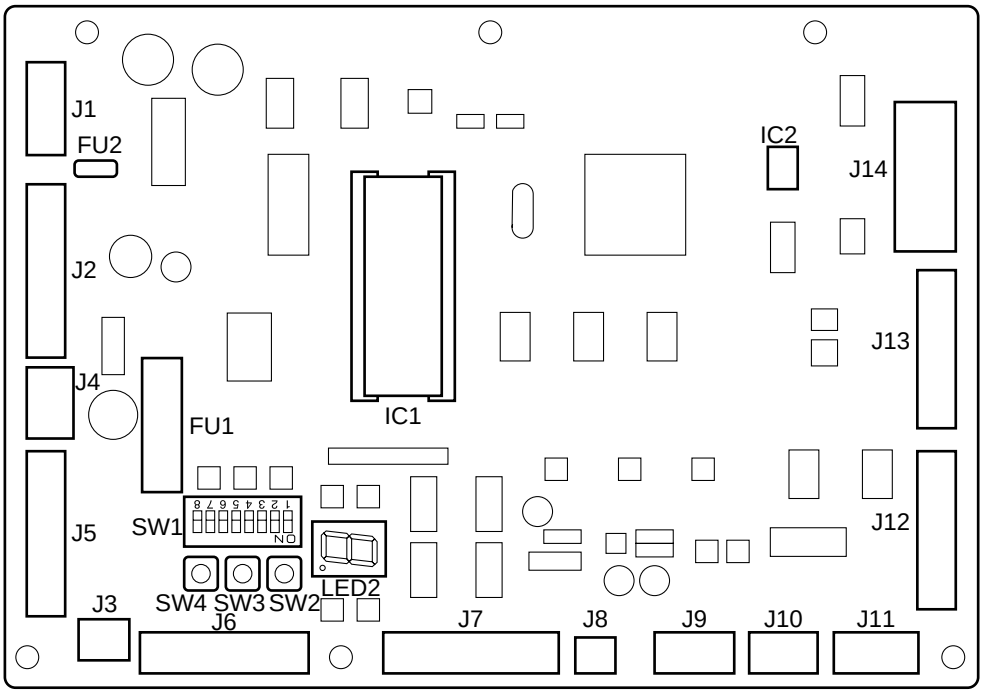

Figure 5-401

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2. DIP Switch Settings and Functions

Table 5-401 shows the functions of the DIP switch (SW1) on the ADF controller PCB in reference to bit settings.

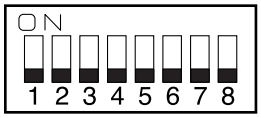
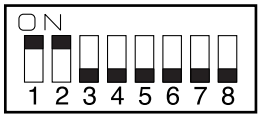
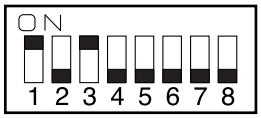
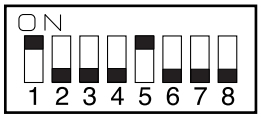
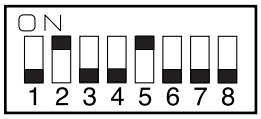
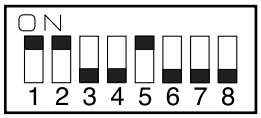
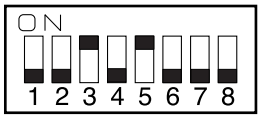
Functions	Settings	Description
Simulating Normal Operation		Causes the machine to simulate normal operation.
Checking the Operation		Feeding a Single-Sided Original Intermittently After a press on the push switch (SW2) on the ADF, each press on the push switch (SW2) will feed the original intermittently.
		Feeding a Double-Sided Original Intermittently After a press on the push switch (SW2) on the ADF controller PCB, each press on the push switch (SW2) will feed the original intermittently.
		Driving the Belt Motor (M2) A press on the push switch (SW2) on the ADF controller PCB will start the belt motor, and another press will stop it, automatically taking the next pattern: clockwise rotation (700 → 520 → 260 → 130 mm/sec) → counterclockwise rotation (700 → 520 → 260 → 130 mm/sec)
		Driving the Reversal Motor (M1) A press on the push switch (SW2) on the ADF controller PCB will start the motor, and another press will stop it, automatically taking the next pattern: clockwise (700 → 520 → 260 → 130 mm/sec) → counterclockwise rotation (700 → 520 → 260 → 130 mm/sec)
		Driving the Delivery Motor (M5) A press on the push switch (SW2) on the ADF controller PCB will start the delivery motor, and another press will stop it. A press on the push switch (SW3) during operation will change the speed of motor rotation every 100 mm/sec (700 → 100 mm/sec).
		Driving the Pickup Motor (M3) A press on the push switch (SW2) on the ADF controller PCB will start the motor. Press SW3 (up) or SW4 (down). Another press on SW2 will stop the motor.

Table 5-401-1

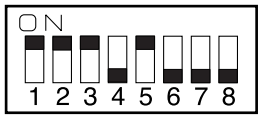
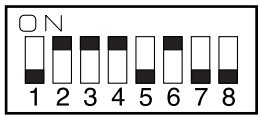
Functions	Settings	Description
Checking the Operation		Driving the Solenoids/Clutches Driving the Pickup Motor (M3) A press on the push switch (SW2) on the ADF controller PCB will drive the following in sequence; they will stop automatically: Stopper plate solenoid (SL2) ↓ Delivery solenoid (SL4) ↓ Pre-reversal solenoid (SL3) ↓ Reversing solenoid (SL1) ↓ Clutch (CL)
		Driving the Separation Motor (M4)/Clutch (CL) A press on the push switch (SW2) on the ADF controller PCB will start the motor, and another press will stop it. Each press on the push switch (SW3) will change the speed of motor rotation every 100 mm/sec (700 → 100 mm/sec).
		Manual Feed Operation With an original placed in the manual feeder, a press on the push switch (SW2) on the ADF controller PCB will start the operation, which stops after delivering an original.
Adjustment		Adjusting the Arching for Tray Pickup A press on the push switch (SW2) on the ADF controller PCB will start the operation. Make adjustments using the push switch SW3 or SW4. After making adjustments, press the push switch (SW2) to store the new setting. (For details, see p. 5-32.)
		Adjusting the Reversal Arching A press on the push switch (SW2) on the ADF controller PCB will start the operation. Make adjustments using the push switch SW3 or SW4. After making adjustments, press the push switch (SW2) to store the new setting. (For details, see p. 5-32.)
		Adjusting the Manual Feed Arching Press the push switch (SW2) on the ADF controller PCB. Make adjustments using the push switch SW3 or SW4. After making adjustments, press the push switch (SW2) to store the new setting. (For details, see p. 5-32.)

Table 5-401-2

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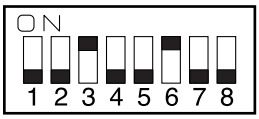
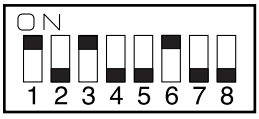
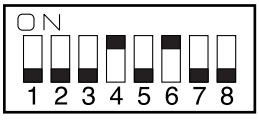
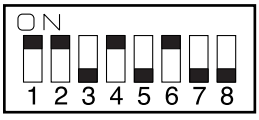
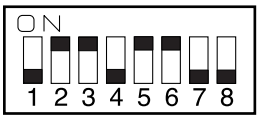
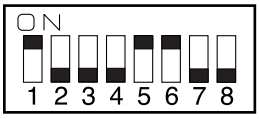
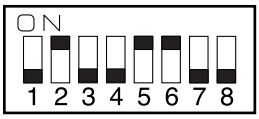
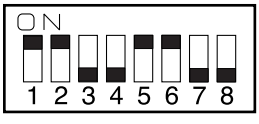
Functions	Settings	Description
Making Adjustments		Adjusting the Speed of the Feeding Belt (reproduction ratio in stream reading) A press on the push switch (SW2) on the ADF controller PCB will start the operation. Make adjustments using the push switch SW3 or SW4. After making adjustments, press the push switch (SW2) to store the new setting. (For details, see p. 5-34.)
		Adjusting the Speed of Reversal A press on the push switch (SW2) on the ADF controller PCB will start the operation. Make adjustments using the push switch SW3 or SW4. After making adjustments, press the push switch (SW2) to store the new setting. (For details, see p. 5-36.)
		Adjusting the Original Stop Position in Fixed Reading Mode A press on the push switch (SW2) on the ADF controller PCB will start the operation. Make adjustments using the push switch SW3 or SW4. After making adjustments, press the push switch (SW2) to store the new setting. (For details, see p. 5-20.)
		Adjusting the Manual Feed Original Stop Position A press on the push switch (SW2) on the ADF controller PCB will start the operation. Make adjustments using the push switch SW3 or SW4. After making adjustments, press the push switch (SW2) to store the new setting. (For details, see p. 5-23.)
		Executing Sensor and Delivery Motor Auto Adjustment A press on the push switch (SW2) on the ADF controller PCB will start the operation, which will stop automatically. (For details, see p. 5-28.)
Indicators		Indicator Indicates the number of jams which have occurred in the machine using LED2 on the ADF controller PCB. (For details, see p. 5-41.)
		Tray Pickup Counter Indicator Indicates the number of left pickups made in the machine using LED2 on the ADF controller PCB. (Fro details, see p. 5-42.)
		Manual Feed Pickup Counter Indicates the number of manual feeder pickups made in the machine using LED2. (For details, see p. 5-42.)
		Jam History Indicator Indicates the jam history (3 jams) of the machine using LED2 on the ADF controller PCB. (For details, see p. 5-43.)

Table 5-401-3

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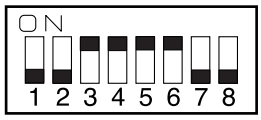
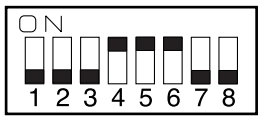
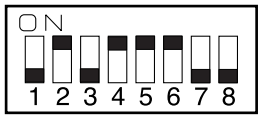
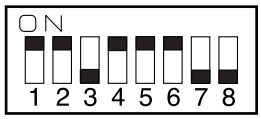
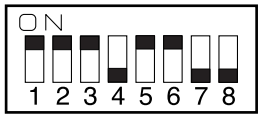
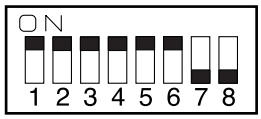
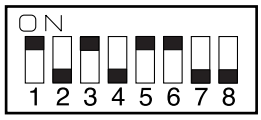
Functions	Settings	Description
Indicators		Software Version Indicator A press on the push switch (SW2) on the ADF controller PCB will indicate the version of the software. Another press stops the indication. (For details, see p. 5-44.)
Cleaning		Cleaning the Separation Assembly A press on the push switch (SW2) on the ADF controller PCB will rotate the registration roller. Another press will stop it. (For details, see p. 5-45.)
		Cleaning the Registration Roller If the dirt is limited, Place ten sheets of copy paper on the original tray, and press the push switch (SW2) on the ADF controller PCB. The operation will end automatically. (For details, see p. 5-47.) If the dirt is excessive, Press the push switch (SW2) on the ADF controller PCB so that the registration roller will rotate. Clean the roller with lint-free paper moistened with alcohol. To stop the operation, press the push switch (SW2) once again. (For details, see p. 5-47.)
		
Others		Checking the Original Width Detecting Switch (SW301) A press on the push switch (SW2) on the ADF controller PCB will start the operation, and another press will stop it. (For details, see p. 5-49.)
		Initializing the Back-Up RAM A press on the push switch (SW2) on the ADF controller PCB will automatically initialize the back-up RAM, and the operation will end automatically. However, note that the counter data (jam, tray pickup, manual feeder pickup) will not be initialized. (For details, see p. 5-50.)
		Setting Mix Paper Configuration Mode A press on the push switch (SW2) on the ADF controller PCB will start the operation. Use the push switch SW3 or SW4 for a switch-over. Then, press the push switch (SW2) to store the new setting. (For details, see p. 5-51.)

Table 5-401-4

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B. Reversal Motor Driver PCB

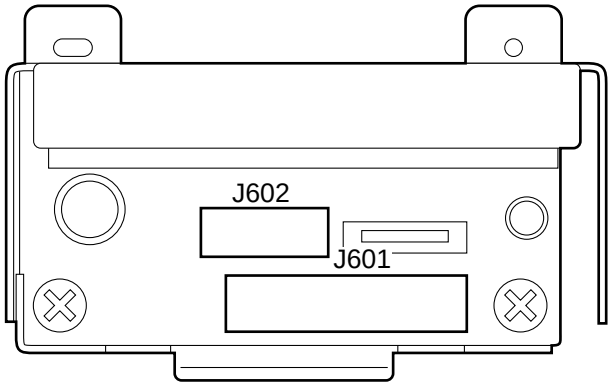

Figure 5-402

C. Belt Motor Driver PCB

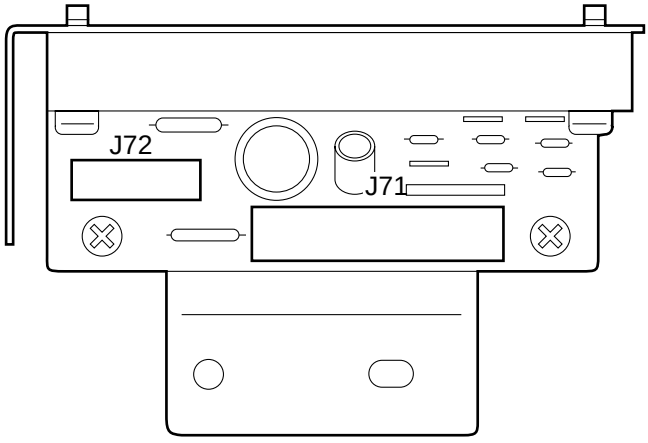

Figure 5-403

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D. Pickup Tray PCB

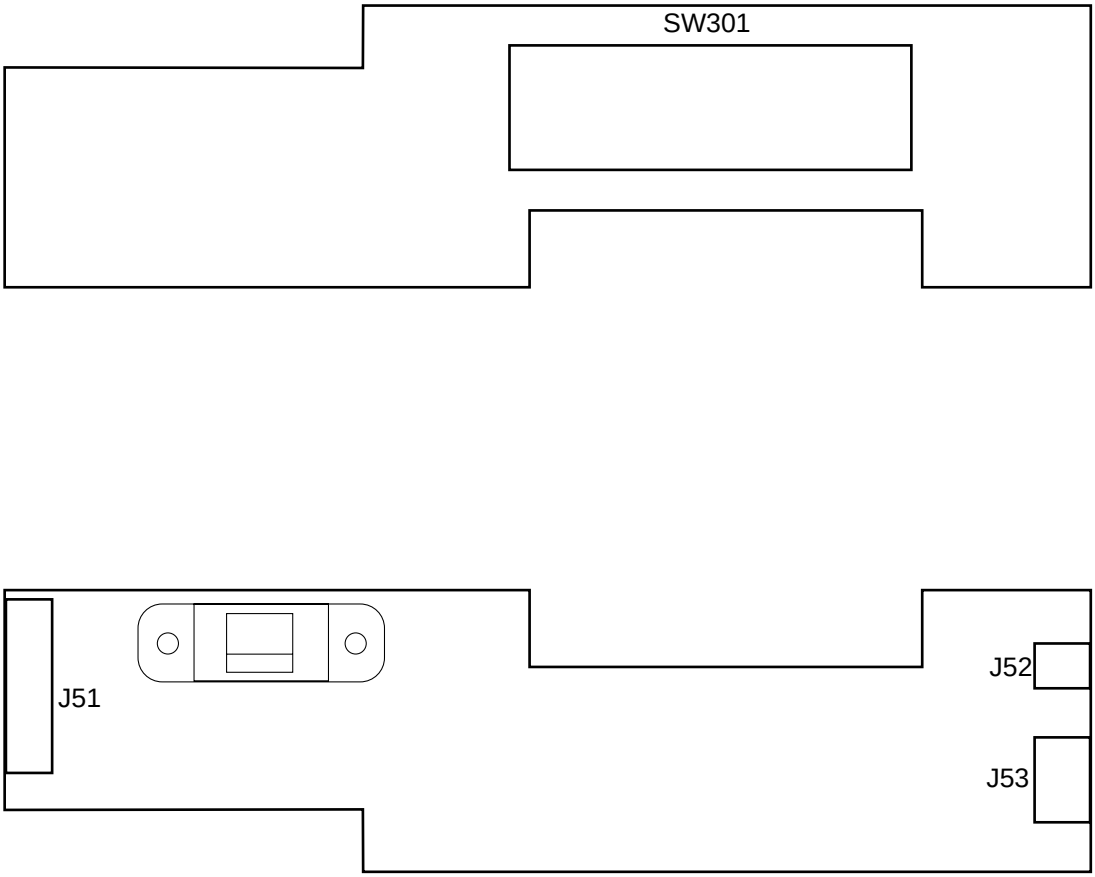

Figure 5-404

E. Indicator LED PCB

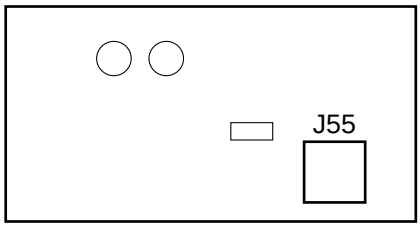

Figure 5-405

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V . SELF DIAGNOSIS

A. Outline

The microprocessor on the machine's ADF controller is equipped with a function to check the condition of the machine. It runs a check as needed and, upon detection of an error, will communicate the fact to the copier in the form of a code.

The nature of communication may be one of three types, which may be checked with reference to the state of LED2 on the ADF controller PCB.

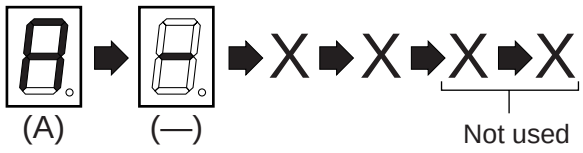
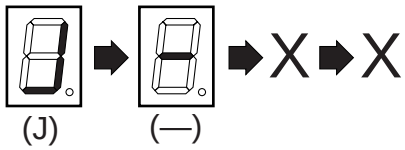
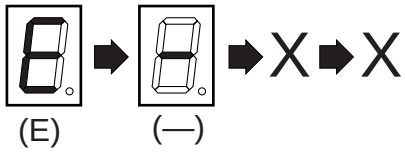
Error	Indicator	State of LED2
Alarm	Flashing at intervals of 240 msec	
Jam	Flashing at intervals of 160 msec	
Error	Flashing at intervals of 80 msec	

Table 5-501

Alarms and jams may be checked as necessary using the copier's service mode. In the event of an error, the copier's display will show the appropriate error code.

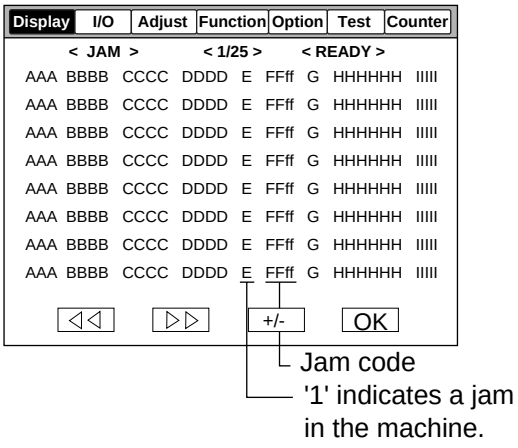

Display
I/O
Adjust
Function
Option
Test
Counter
< JAM >
< 1/25 >
< READY >
AAA BBBB CCCC DDDD E FFff G HHHHHH IIIII
AAA BBBB CCCC DDDD E FFff G HHHHHH IIIII
AAA BBBB CCCC DDDD E FFff G HHHHHH IIIII
AAA BBBB CCCC DDDD E FFff G HHHHHH IIIII
AAA BBBB CCCC DDDD E FFff G HHHHHH IIIII
AAA BBBB CCCC DDDD E FFff G HHHHHH IIIII
AAA BBBB CCCC DDDD E FFff G HHHHHH IIIII
AAA BBBB CCCC DDDD E FFff G HHHHHH IIIII
◁◁
▷▷
+/-
OK
Jam code
'1' indicates a jam
in the machine.

Figure 5-501

B. Alarms

Table 5-502 shows the types of alarms.

Code	Error description	Machine operation	Copier operation	Resetting
03xx	The separation sensor does not detect an original a specific period of time (feed) after starting to separate the 1st page.	Stops the ongoing operation, and flashes the Original Set indicator.	Stops the ongoing operation.	Remove the originals, and set them once again.
11xx	The last page is detected before completing the feeding of "recovery" pages during jam recovery operation.	Stops the ongoing operation, and flashes the Original Set indicator.	Stops the ongoing operation.	Remove the originals, and set them as they were initially.

Table 5-502

C. Jams

For details on jams, see p. 2-72.

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D. Errors

Code	Cause	Description
E400	• A fault exists in the communication cable between the machine and the copier. • An error exists in the ADF controller PCB.	• The communication between the machine and the copier was interrupted for 5 sec or more while the machine was in standby. • The communication between the machine and the copier was interrupted for 0.5 sec or more while the machine was in operation.
E402	• An error exists in the belt motor (M2). • An error exists in the belt motor clock sensor (PI1). • An error exists in the ADF controller PCB.	• The clock signals were not generated for 100 msec while the belt motor drive signal was being generated.
E404	• An error exists in the delivery motor (M5). • An error exists in the delivery motor clock sensor (PI11). • An error exists in the ADF controller PCB.	• The clock signals were not generated for 200 msec while the delivery motor drive signal was being generated.
E405	• An error exists in the separation motor (M4). • An error exists in the separation motor clock sensor (PI2). • An error exists in the ADF controller PCB.	• The clock signals were not generated for 200 msec while the separation motor drive signal was being generated.
E410	• An error exists in the pickup motor (M3). • An error exists in the pickup roller height sensor 1 (PI8). • An error exists in the pickup roller height sensor 2 (PI9). • An error exists in the pickup roller home position sensor (PI7). • An error exists in the ADF controller PCB.	• The pickup roller height sensors 1 (PI8) and 2 (PI9) did not generate signals within 2 sec after the pickup motor had been driven. • The pickup roller home position sensor (PI7) did not generate signals within 2 sec after the pickup motor had been driven.
E420	• The back-up data could not be read, or the data that was read had an error.	• The back-up data could not be read twice when the copier was turned on, or the data which was read had an error.

Table 5-503

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APPENDIX

A. General Timing Chart A-1
B. Signals and Abbreviations A-9
C. General Circuit Diagram A-11
D. ADF Controller Circuit Diagram A-13
E. Reversal Motor Driver Circuit Diagram A-25
F. Belt Motor Driver Circuit Diagram A-26
G. Reversal Sensor Circuit Diagram A-27
H. Pre-/Post-Registration Roller Sensor Circuit Diagram..... A-28
I. Separation Sensor/Skew Sensor Circuit Diagram A-29
J. Original Sensor (light-emitting) Circuit Diagram A-30
K. Original Sensor (light-receiving) Circuit Diagram A-30
L. Tray Circuit Diagram A-31
M. Pre-Last Original Paper Sensor Circuit Diagram A-33
N. Original Set Indicator Circuit Diagram A-33
O. Manual Feed Registration Roller Paper Sensor Circuit Diagram A-34
P. Special Tools A-35
Q. Solvents and Oils List A-35

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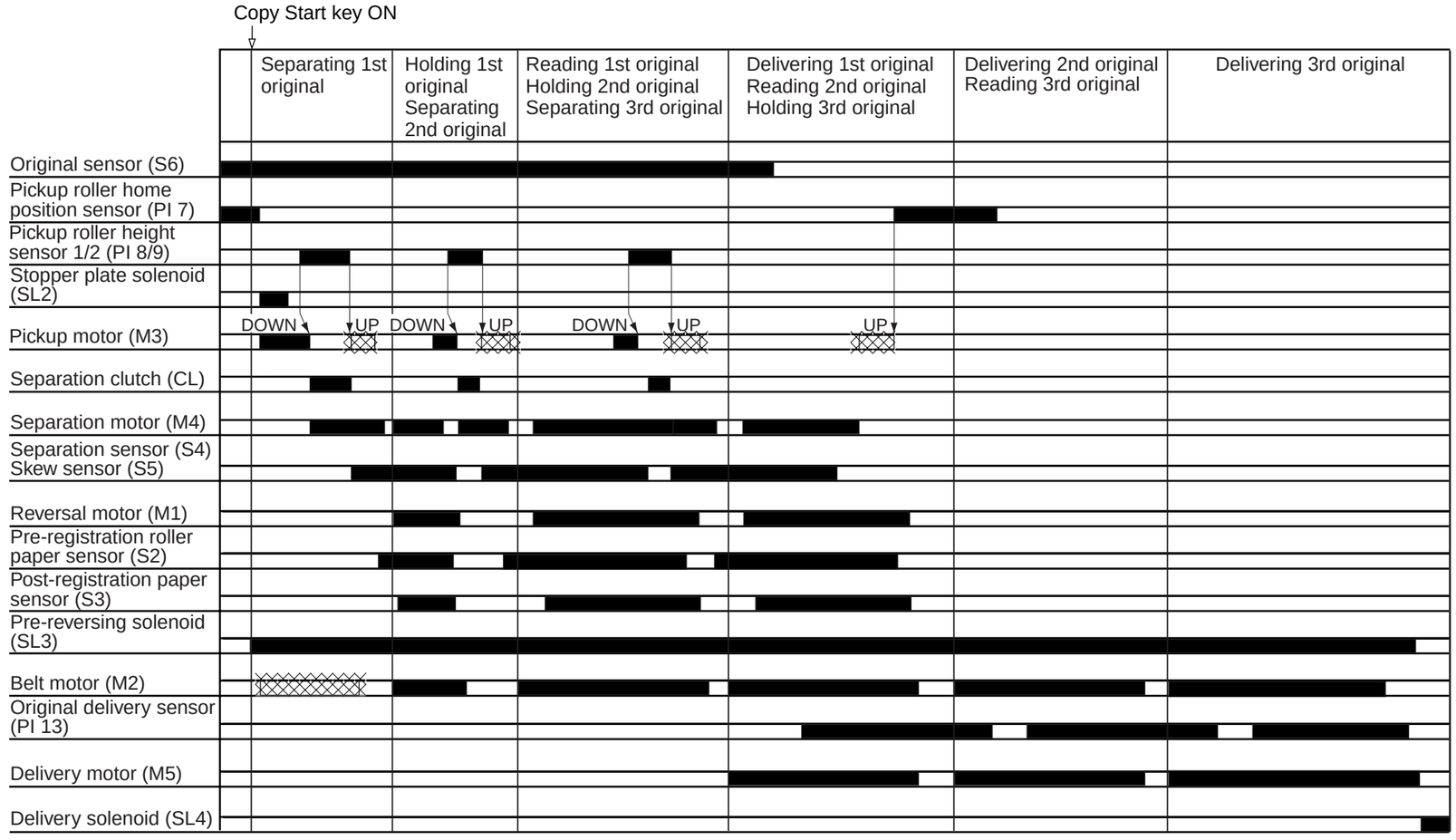
A. General Timing Chart

1. A4, 3 Single-Sided Originals, Stream Reading



: motor CCW rotation.

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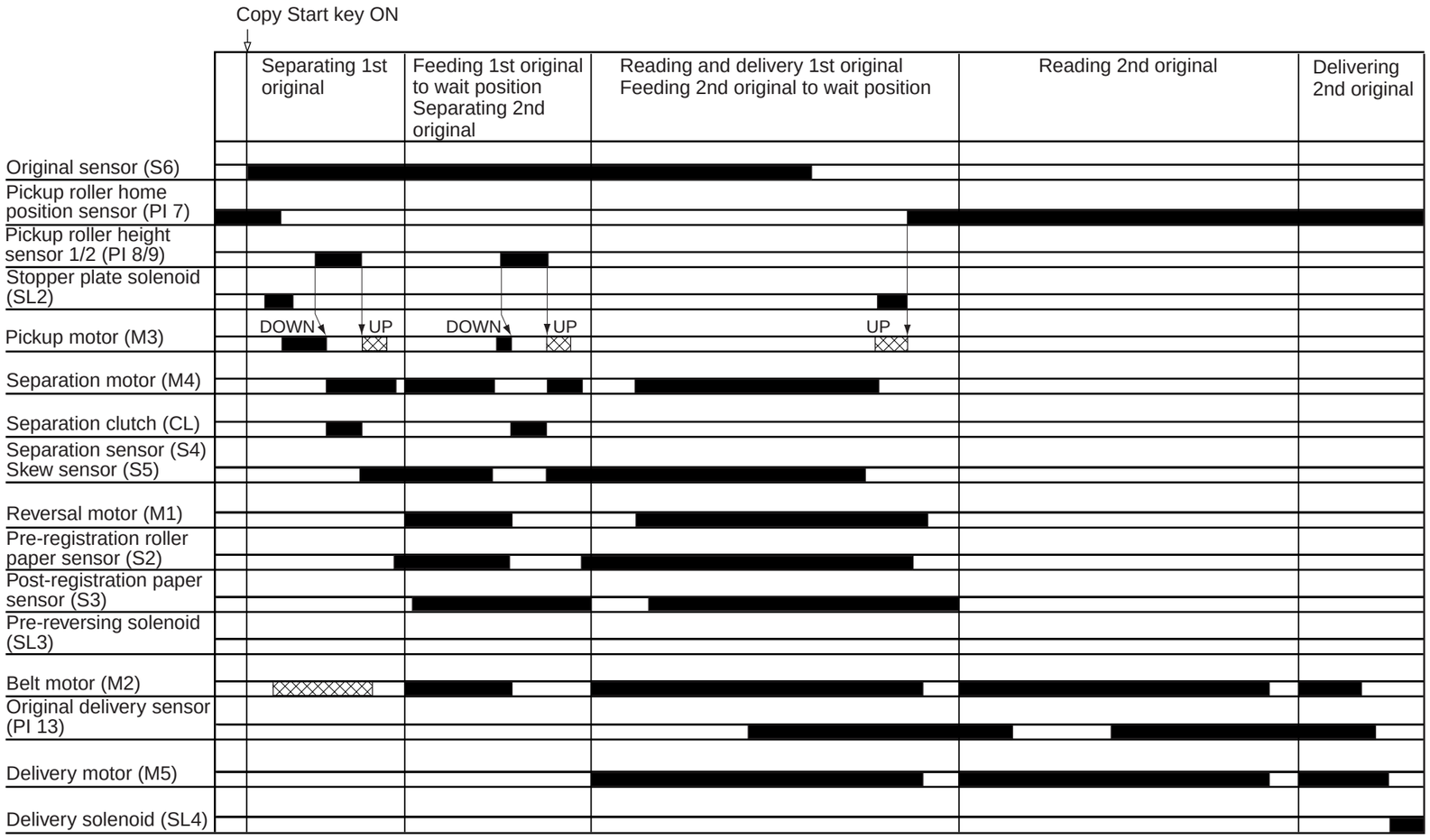
2. A3, 2 Single-Sided Originals, Stream Reading



: motor CCW rotation.

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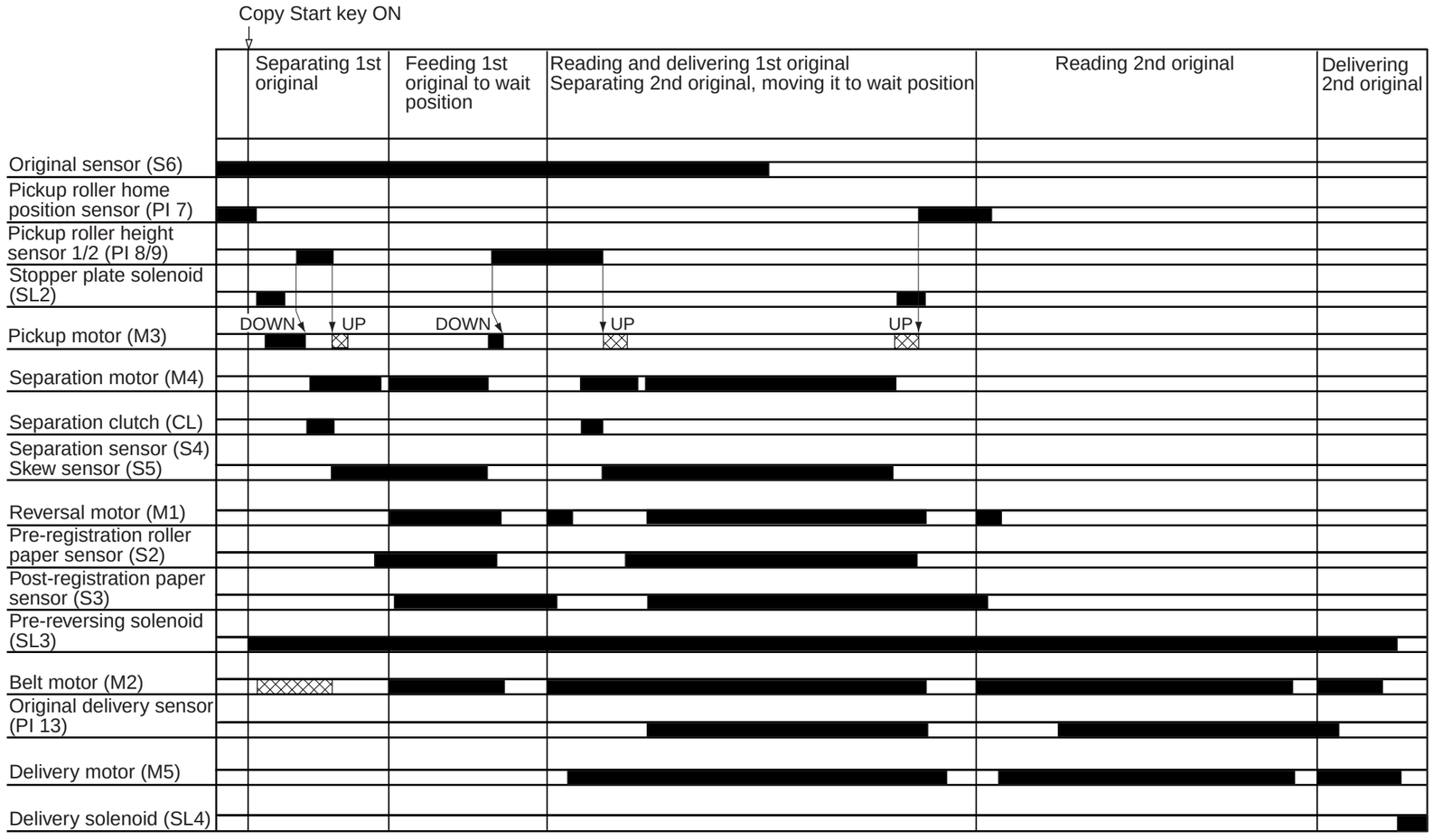
3. 279.4x431.8 mm (11"x17"), 2 Single-Sided Originals, Stream Reading



: motor CCW rotation.

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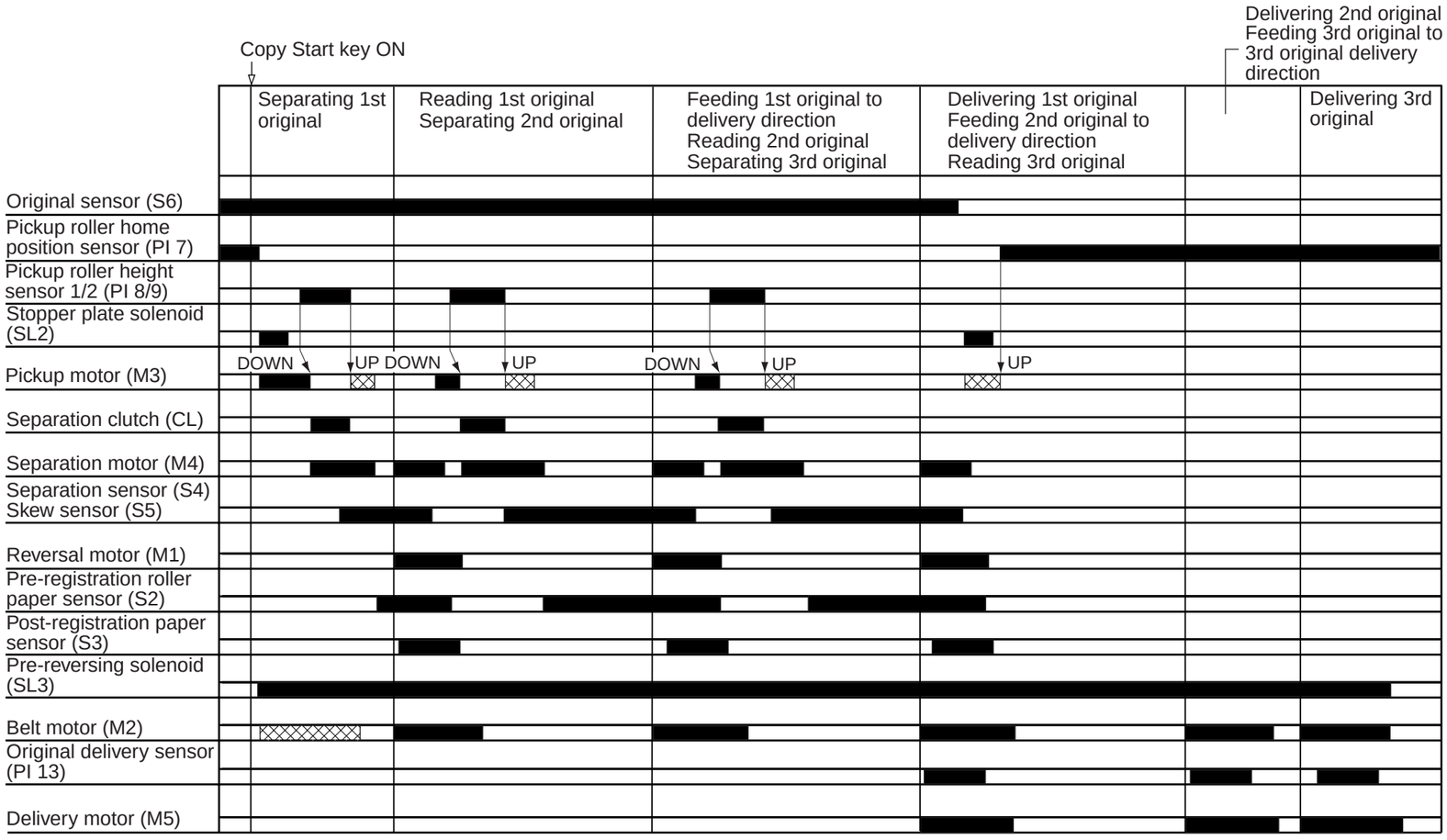
4. A4, 3 Single-Sided Originals, Fixed Reading



: motor CCW rotation.

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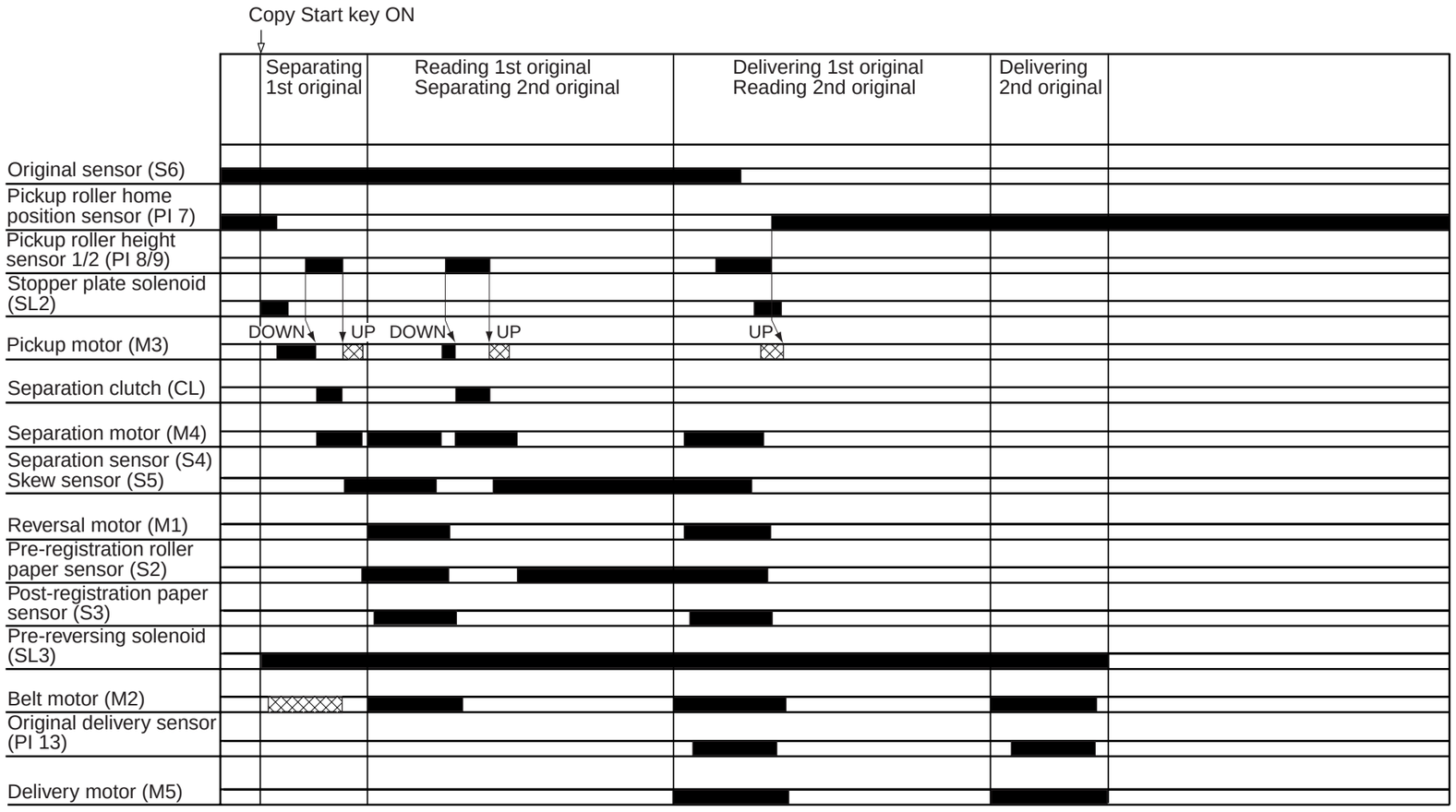
5. A3, 2 Single-Sided Originals, Fixing Reading



: motor CCW rotation.

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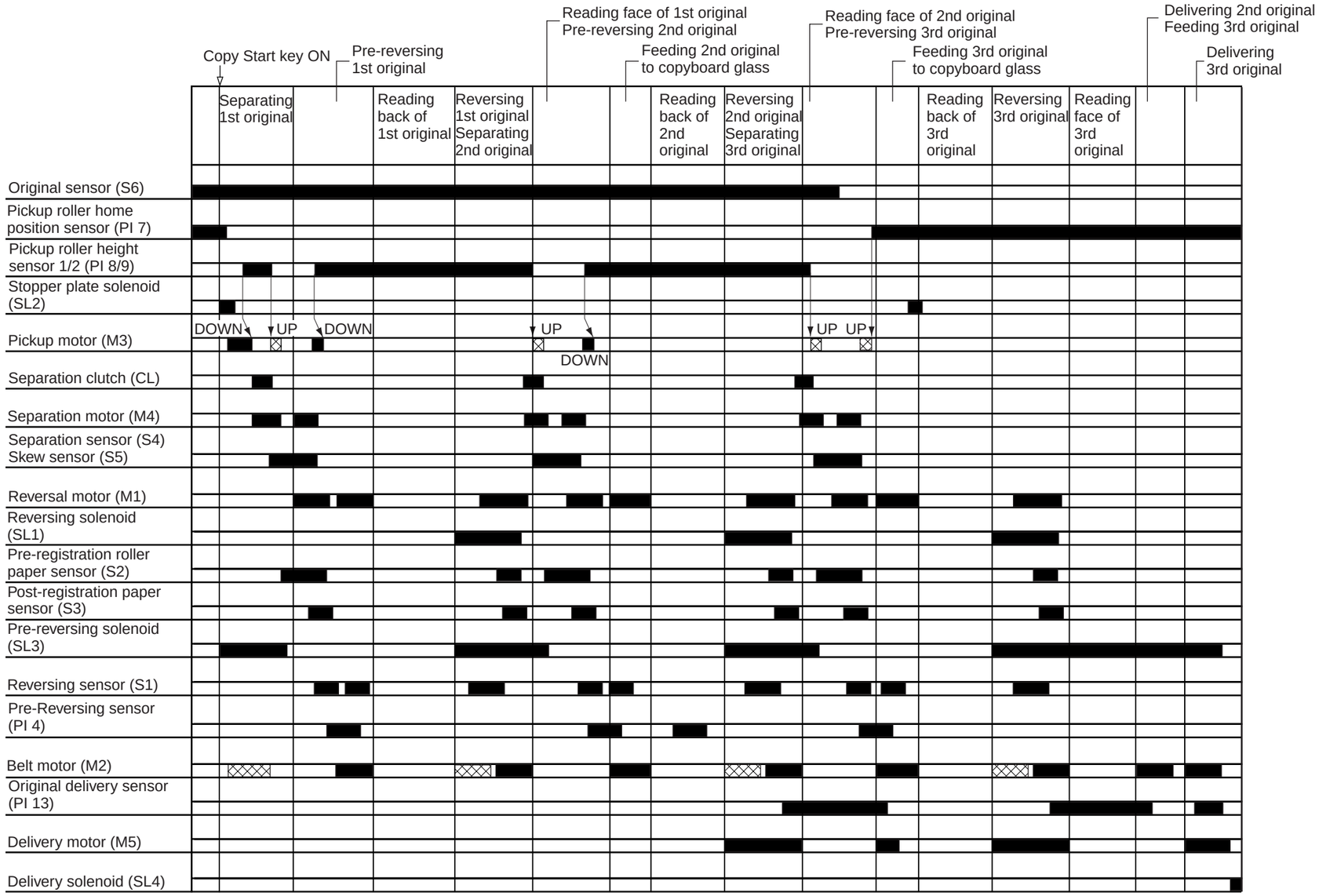
6. A4, 3 Double-Sided Originals, Fixing Reading



: motor CCW rotation.

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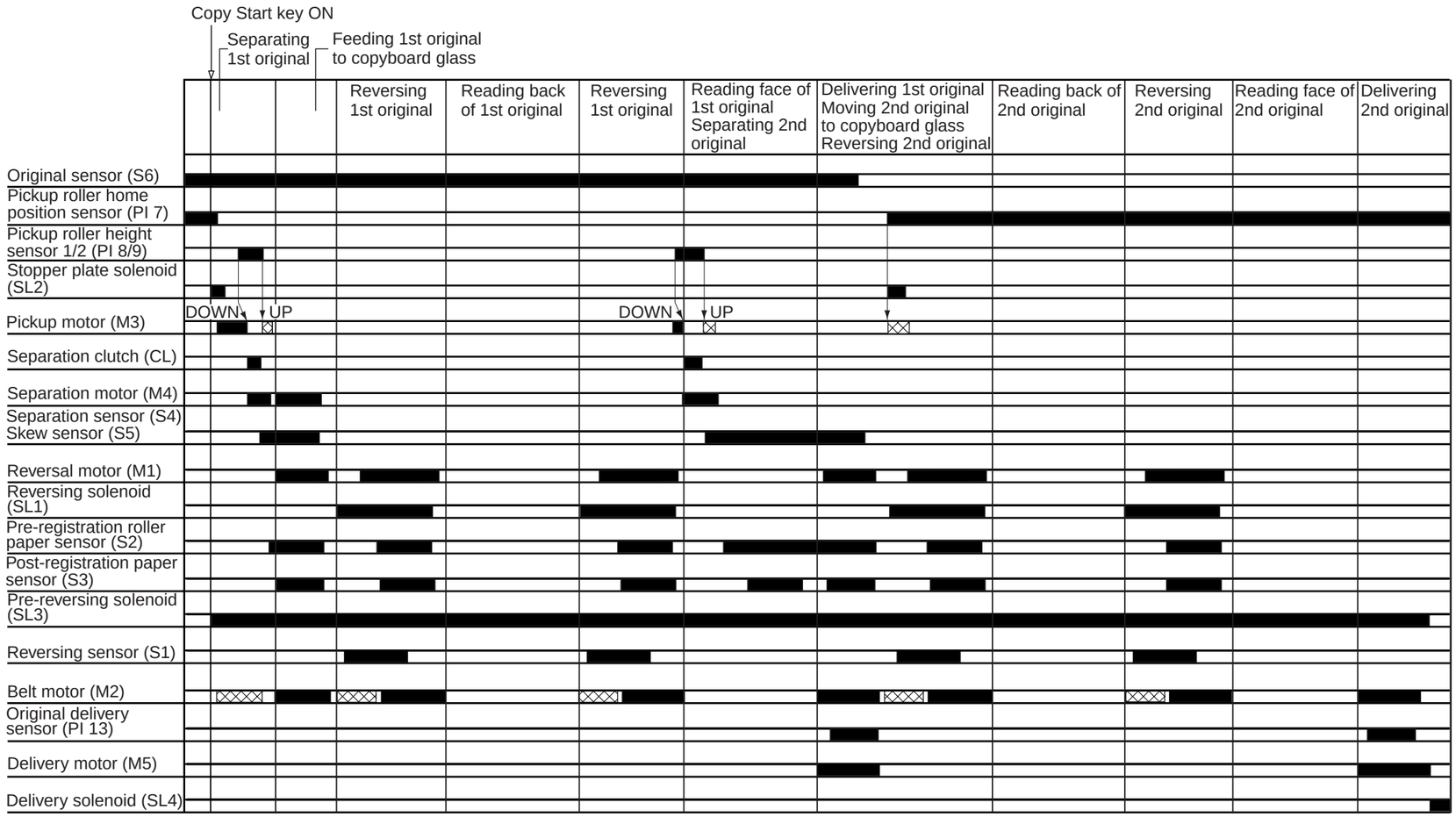

⊠ : motor CCW rotation.

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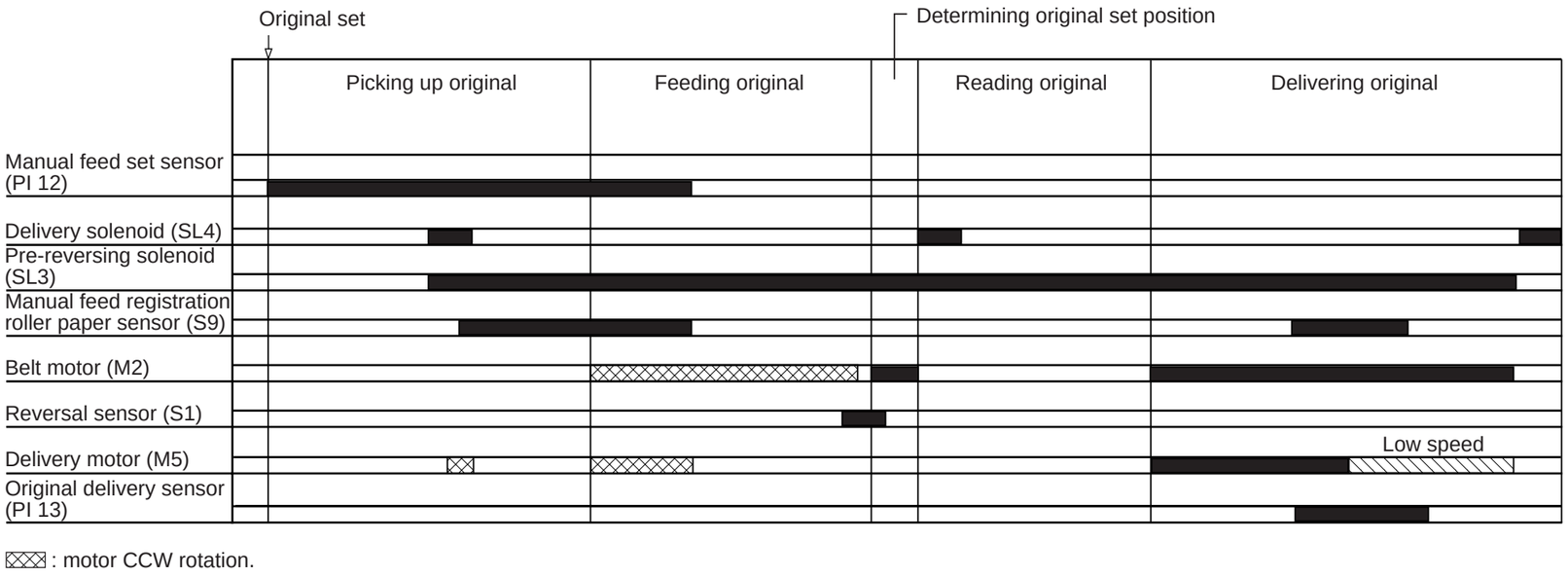
8. A4, 1 Single-Sided Original, Manual Feeding



⊠ : motor CCW rotation.

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B. Signals and Abbreviations

The following is a list of signals and its abbreviations used in this chapter and circuit diagrams.
The abbreviations in parentheses are electrical signals but are analog, which cannot be expressed in terms of '1' or '0'. Others are digital signals, which can be expressed in terms of '1' and '0'.

BTCLK	Belt Motor Clock Detection signal
B-Vref	Belt Motor Rotation Torque signal
CLD*	Clutch Drive command
CW/CCW	Rotation Direction signal
DTLED	Original Set LED Drive command
DTS	Original Detection signal
DTSAJ	Original Detection Reference signal
EJCLK	Delivery Motor Clock Detection signal
EJJAM	Original Delivery Detection signal
EJMD*	Delivery Motor Drive command
LAS	Pre-Last Original Paper Detection signal
LASAJ	Pre-Last Original Paper Detection Reference signal
LCVF	Left Cover Front Open/Closed Detection signal
LCVR	Left Cover Rear Open/Closed Detection signal
M1OA	Reversal Motor Drive command
M1OA*	Reversal Motor Drive command
M1OB	Reversal Motor Drive command
M1OB*	Reversal Motor Drive command
M3OA	Pick-Up Motor Drive command
M3OA*	Pick-Up Motor Drive command
M3OB	Pick-Up Motor Drive command
M3OB*	Pick-Up Motor Drive command
MFRGS	Manual Feeder Registration Roller Original Detection signal
MFRGSAJ	Manual Feeder Registration Roller Original Detection Reference signal
MFST	Manual Feeder Original Set Detection signal
MO1	Belt Motor Drive command
MO2	Belt Motor Drive command
PKH1	Pick-Up Roller Height Detection signal 1
PKH2	Pick-Up Roller Height Detecting signal 2
PKHP	Pick-Up Roller Home Position Detection signal
REF-CLK	Belt Motor Phase Control command

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RFOP	ADF Open/Closed Detection signal
RGAS	Registration Rear Original Edge Detecting signal
RGASAJ	Registration Roller Rear Original Edge Detection Reference signal
RGBS	Registration Roller Front Original Edge Detection signal
RGBSAJ	Registration Roller Front Original Edge Detection Reference signal
PRTR	Pre-Reversal Detection signal
SEPM+	Separation Motor Drive command
SEPM-	Separation Motor Drive command
SKS	Original Skew Detection signal
SKSAJ	Original Skew Detection Reference signal
SL1D*	Reversing Solenoid Drive command
SL2D1*	Stopper Plate Solenoid Drive command (position 1)
SL2D2*	Stopper Plate Solenoid Drive command (position 2)
SL3D*	Pre-Reversal Solenoid Drive command
SL4D1*	Delivery Solenoid Drive signal (position 1)
SL4D2*	Delivery Solenoid Drive signal (position 2)
SPCLK	Separation Motor Clock Detection signal
SPS	Separation Detection signal
SPSAJ	Separation Detection Reference signal
SSW-0	Original Width Detection signal 0
SSW-1	Original Width Detection signal 1
SSW-2	Original Width Detection signal 2
SSW-3	Original Width Detection signal 3
SSW-4	Original Width Detection signal 4
TAILS	Original Trailing Edge Detection signal
TAILSAJ	Original Rear Edge Detection Reference signal
TNS	Reversal Detection signal
TNSAJ	Reversal Detection Reference signal
TRCLK	Registration Roller Clock Detection signal
T-Vref	Reversal Motor Rotation Torque signal

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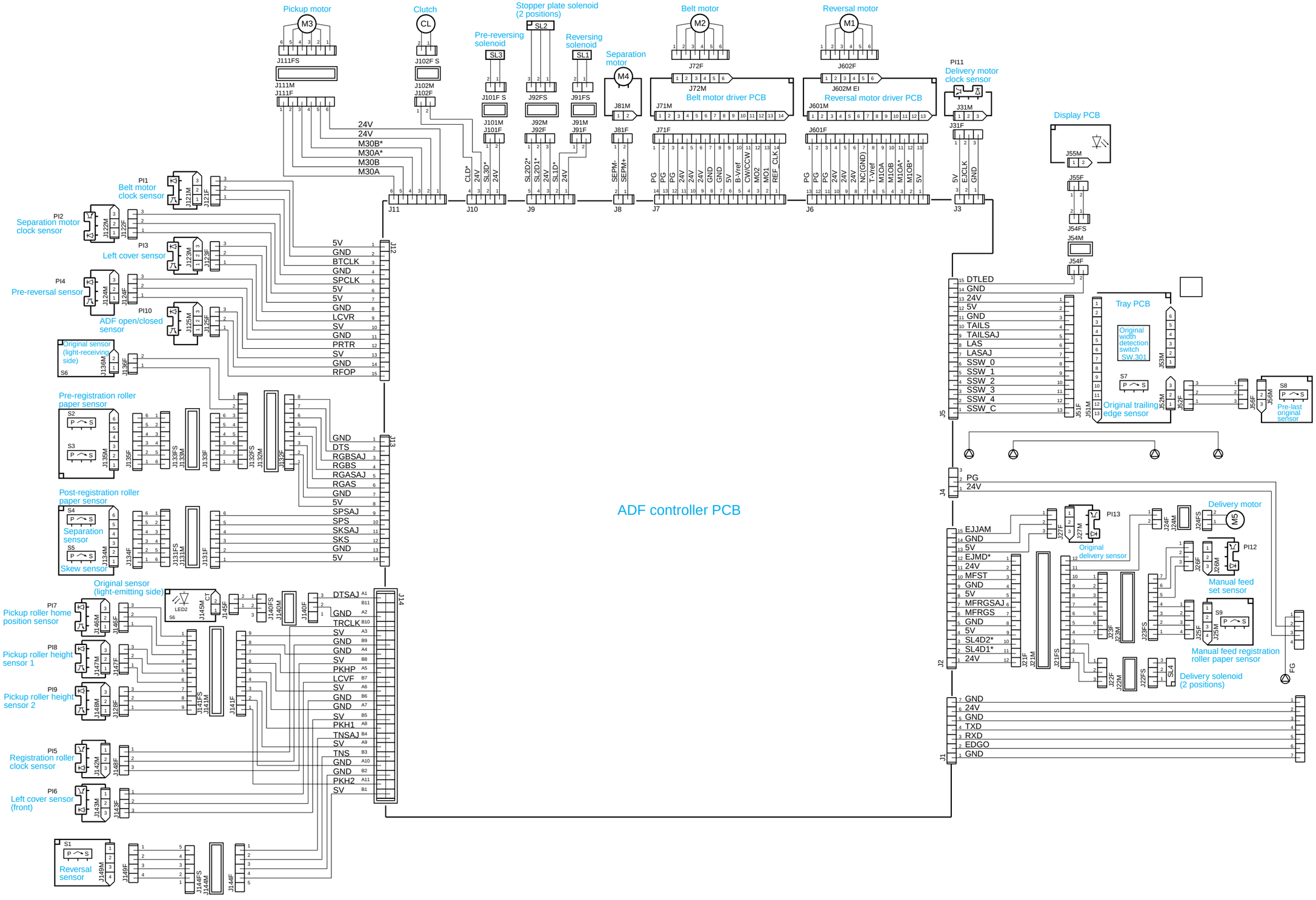
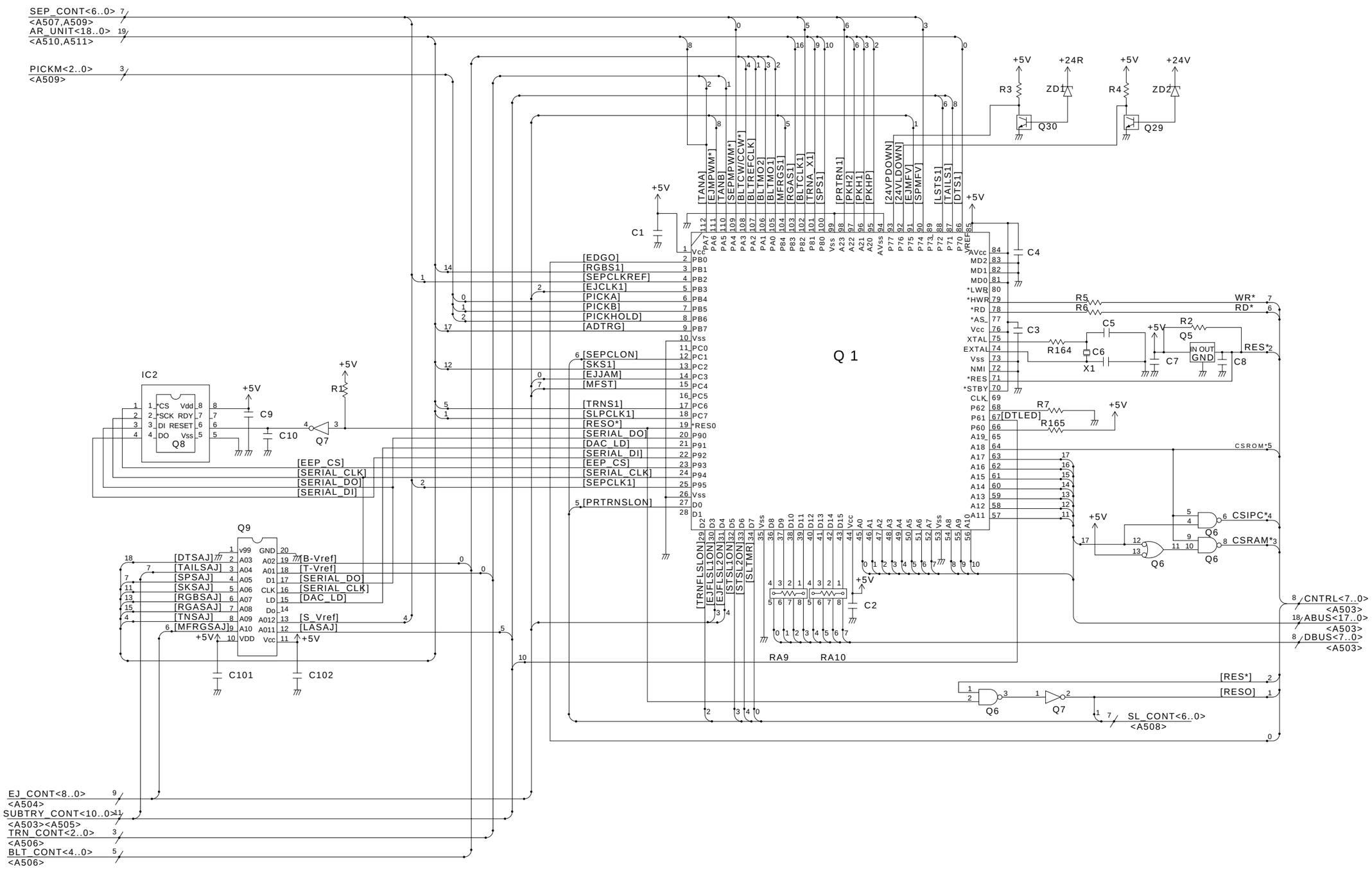

ADF controller PCB
Pickup motor
Clutch
Stopper plate solenoid (2 positions)
Pre-reversing solenoid
Reversing solenoid
Separation motor
Belt motor
Reversal motor
Belt motor driver PCB
Reversal motor driver PCB
Delivery motor clock sensor
Display PCB
Tray PCB
Original width detection switch SW301
Original trailing edge sensor
Pre-last original sensor
PI1 Belt motor clock sensor
PI2 Separation motor clock sensor
PI3 Left cover sensor
PI4 Pre-reversal sensor
PI10 ADF open/closed sensor
Original sensor (light-receiving side)
Pre-registration roller paper sensor
Post-registration roller paper sensor
Separation sensor
Skew sensor
Original sensor (light-emitting side)
PI7 Pickup roller home position sensor
PI8 Pickup roller height sensor 1
PI9 Pickup roller height sensor 2
PI5 Registration roller clock sensor
PI6 Left cover sensor (front)
Reversal sensor
PI13 Original delivery sensor
Delivery motor
PI12 Manual feed set sensor
Manual feed registration roller paper sensor
Delivery solenoid (2 positions)

D. ADF Controller Circuit Diagram

ADF Controller Circuit Diagram (1/11) A502



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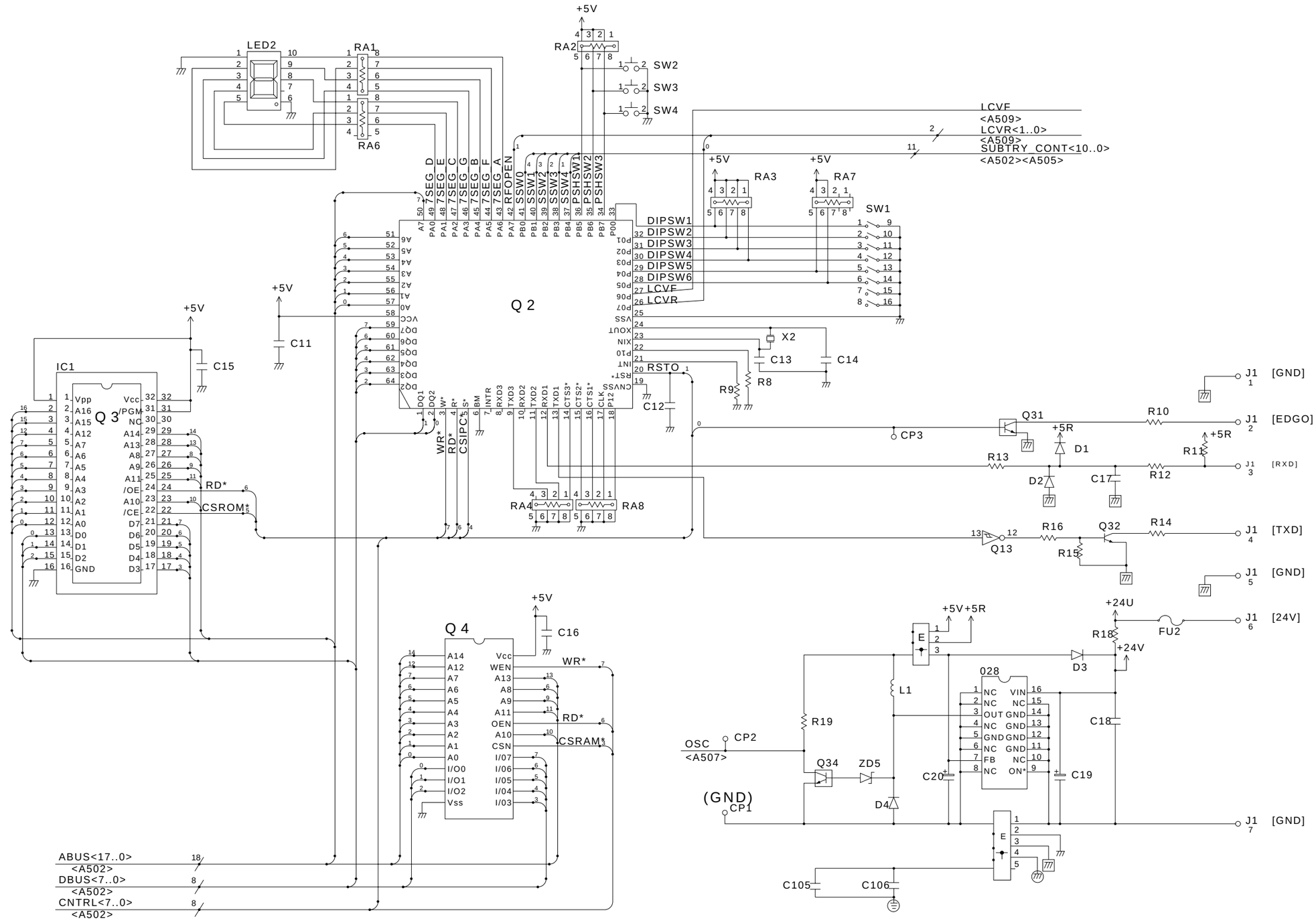
ADF Controller Circuit Diagram (2/11) A503



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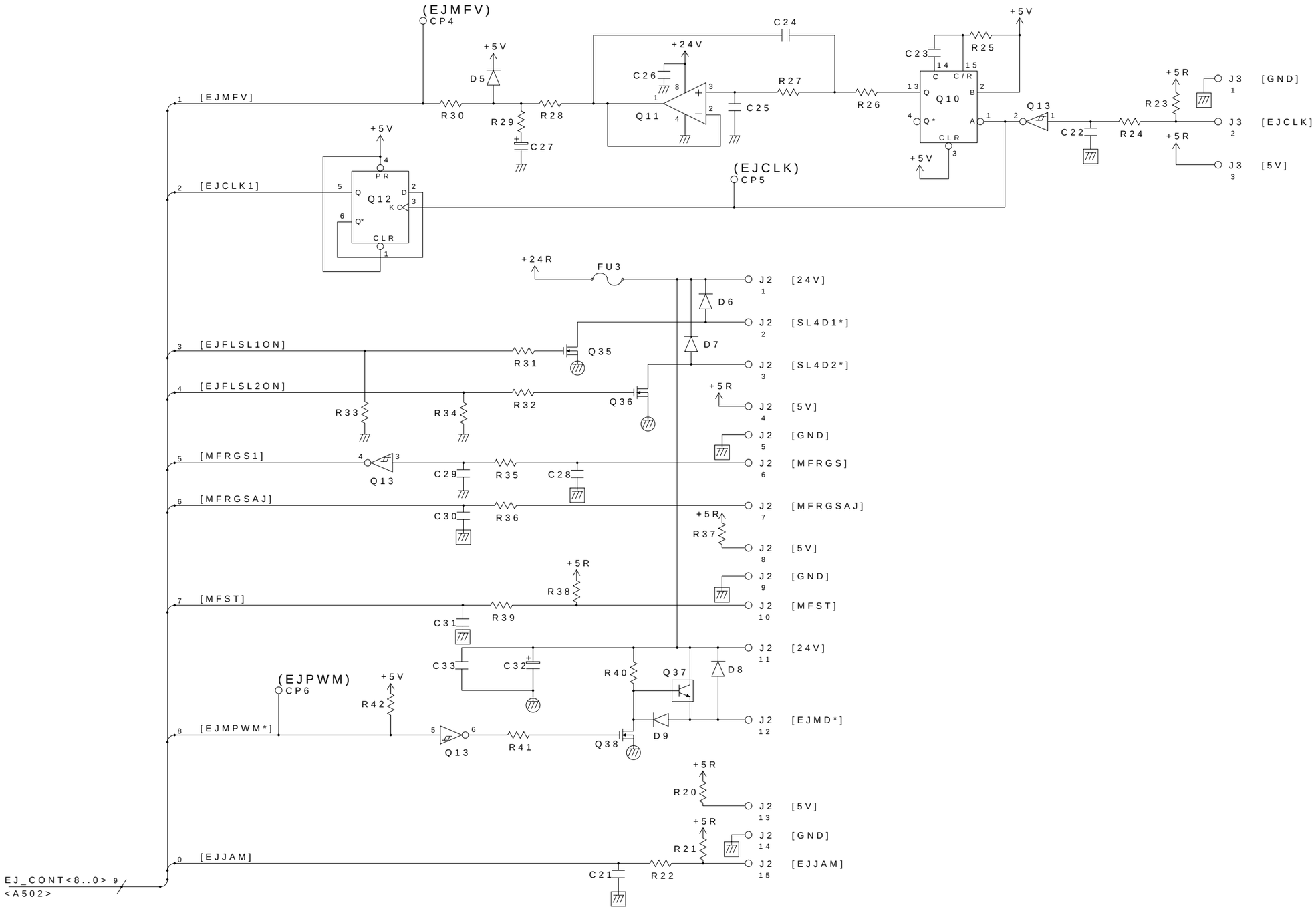

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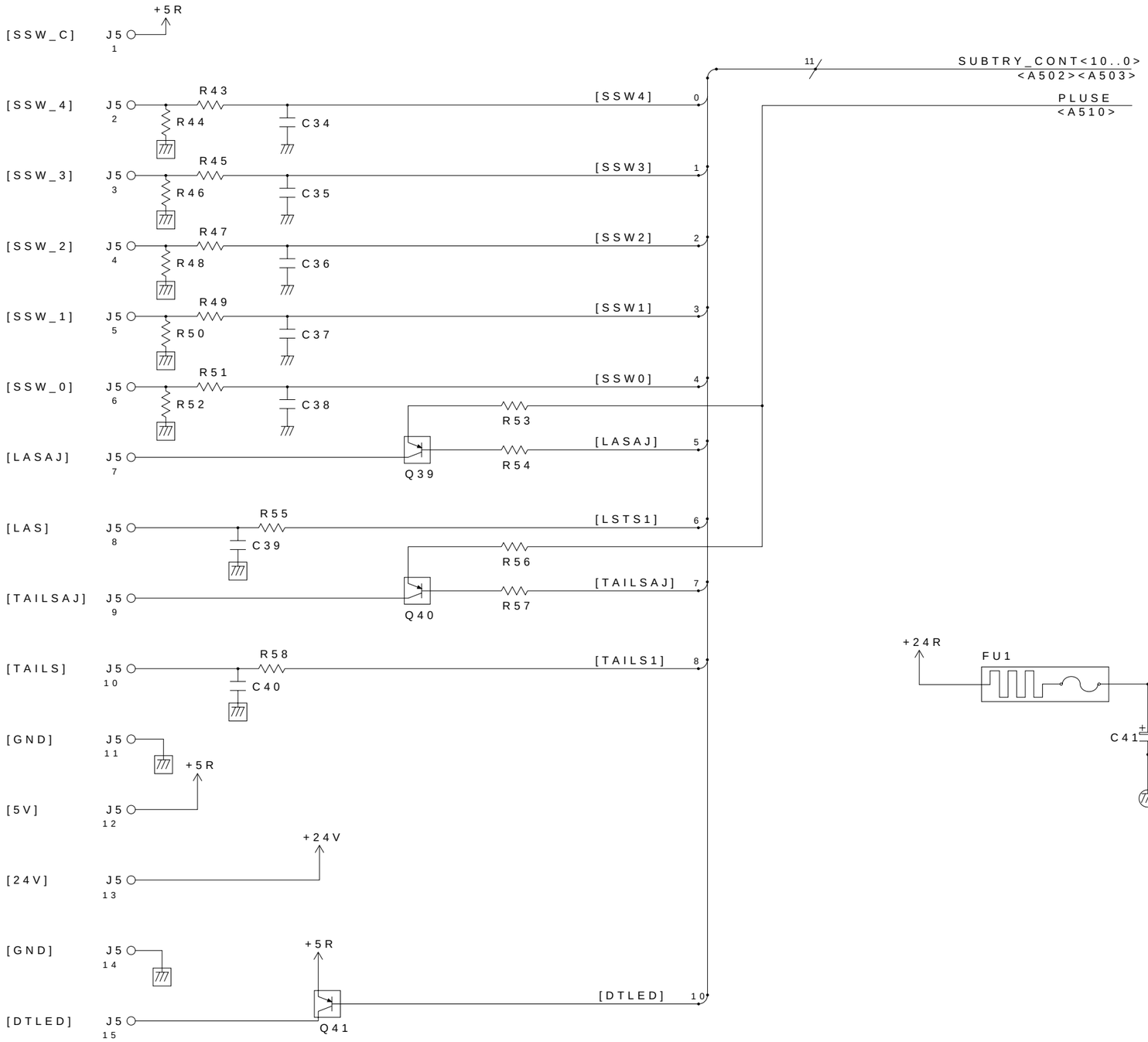
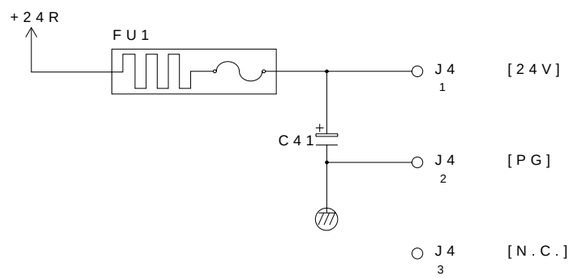
ADF Controller Circuit Diagram (4/11) A505





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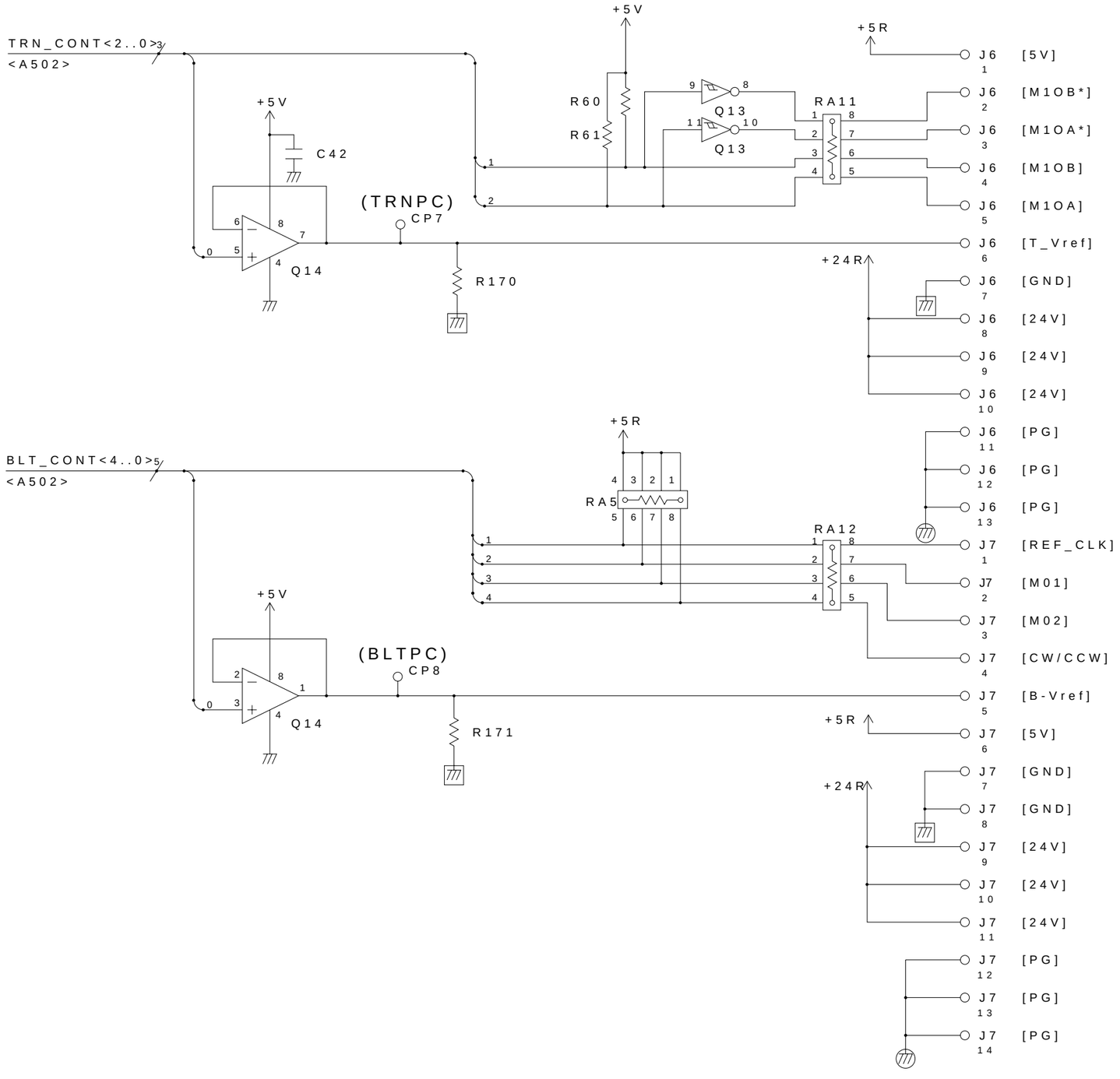

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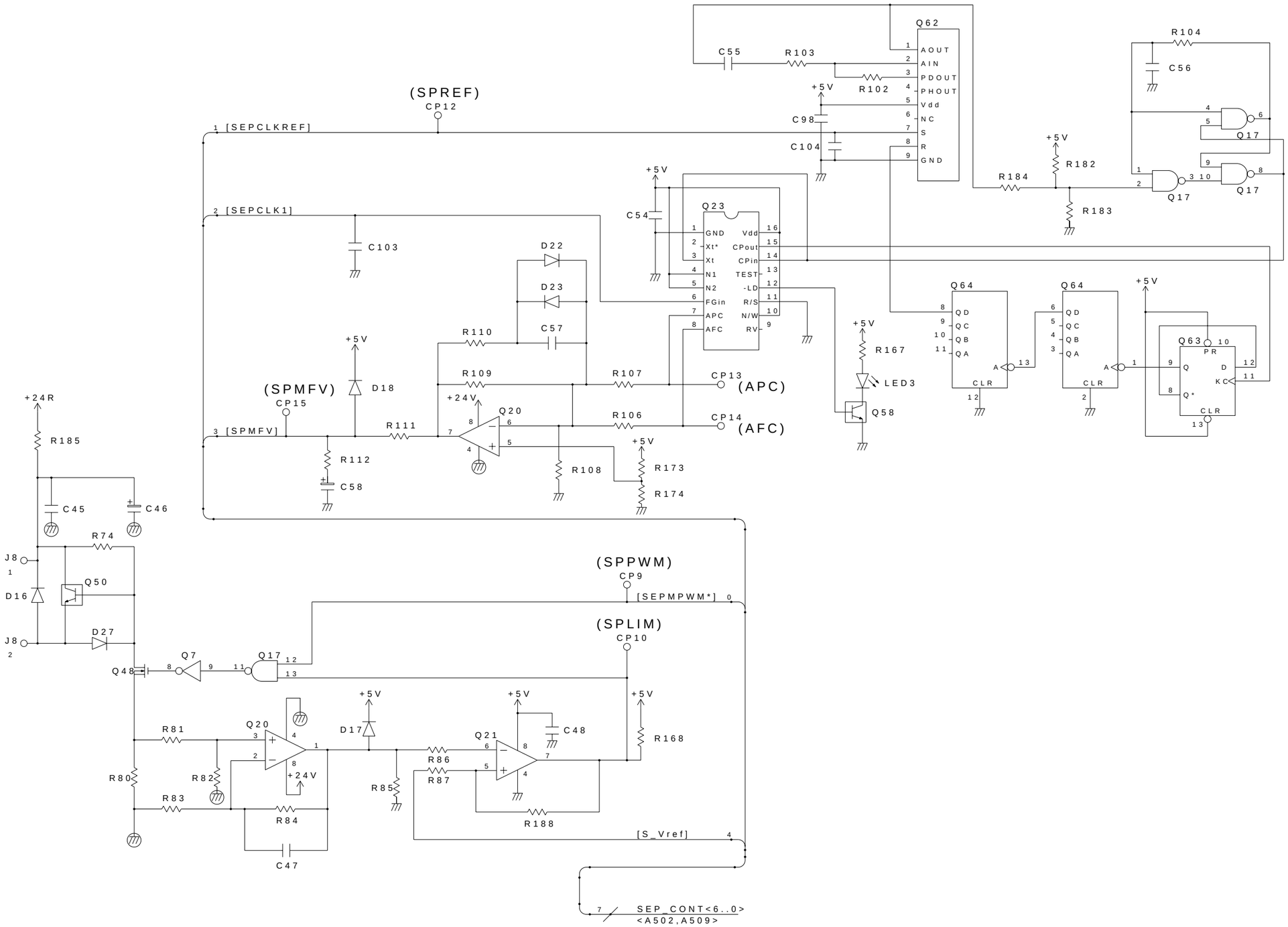
ADF Controller Circuit Diagram (6/11) A507



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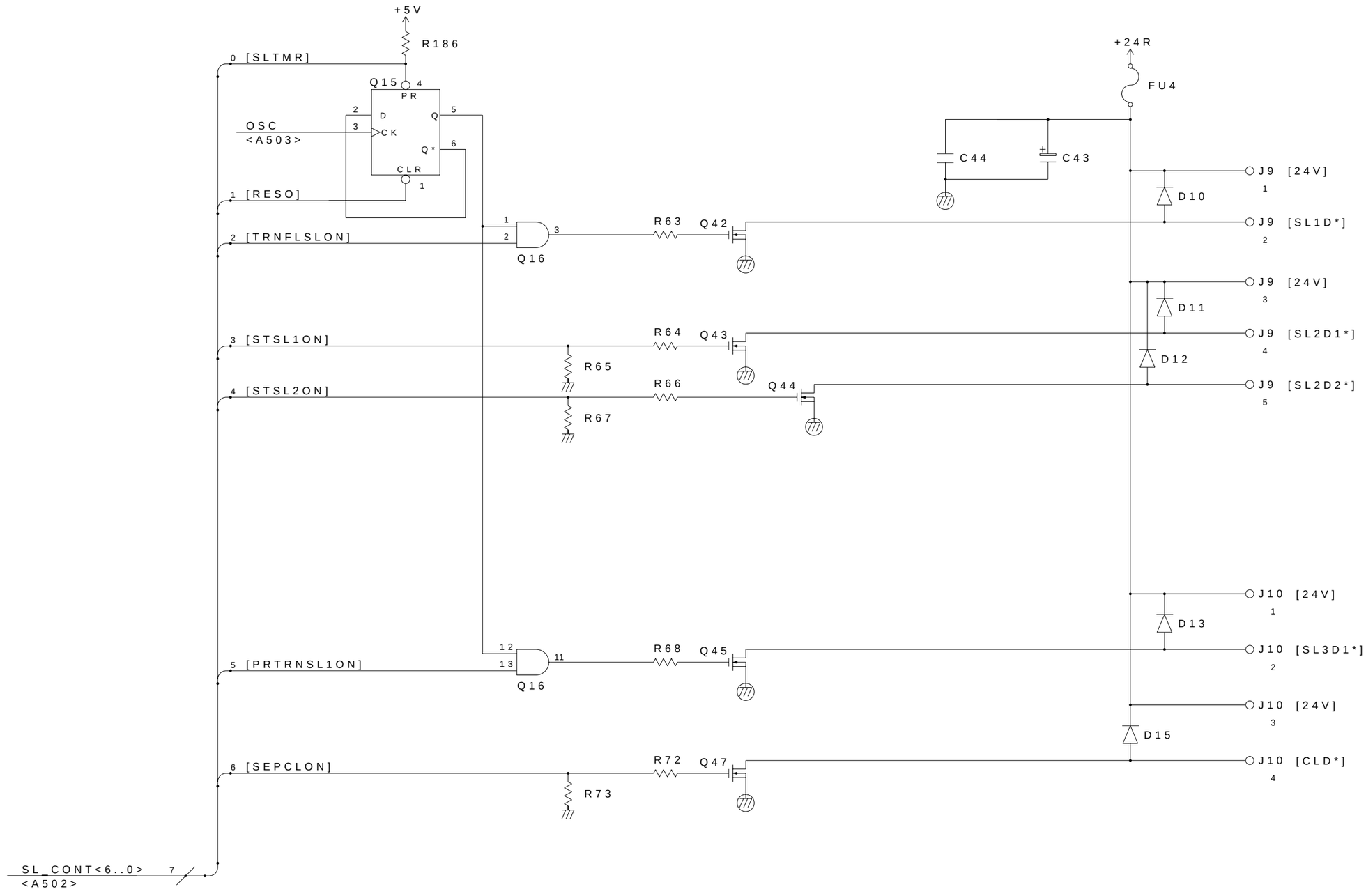

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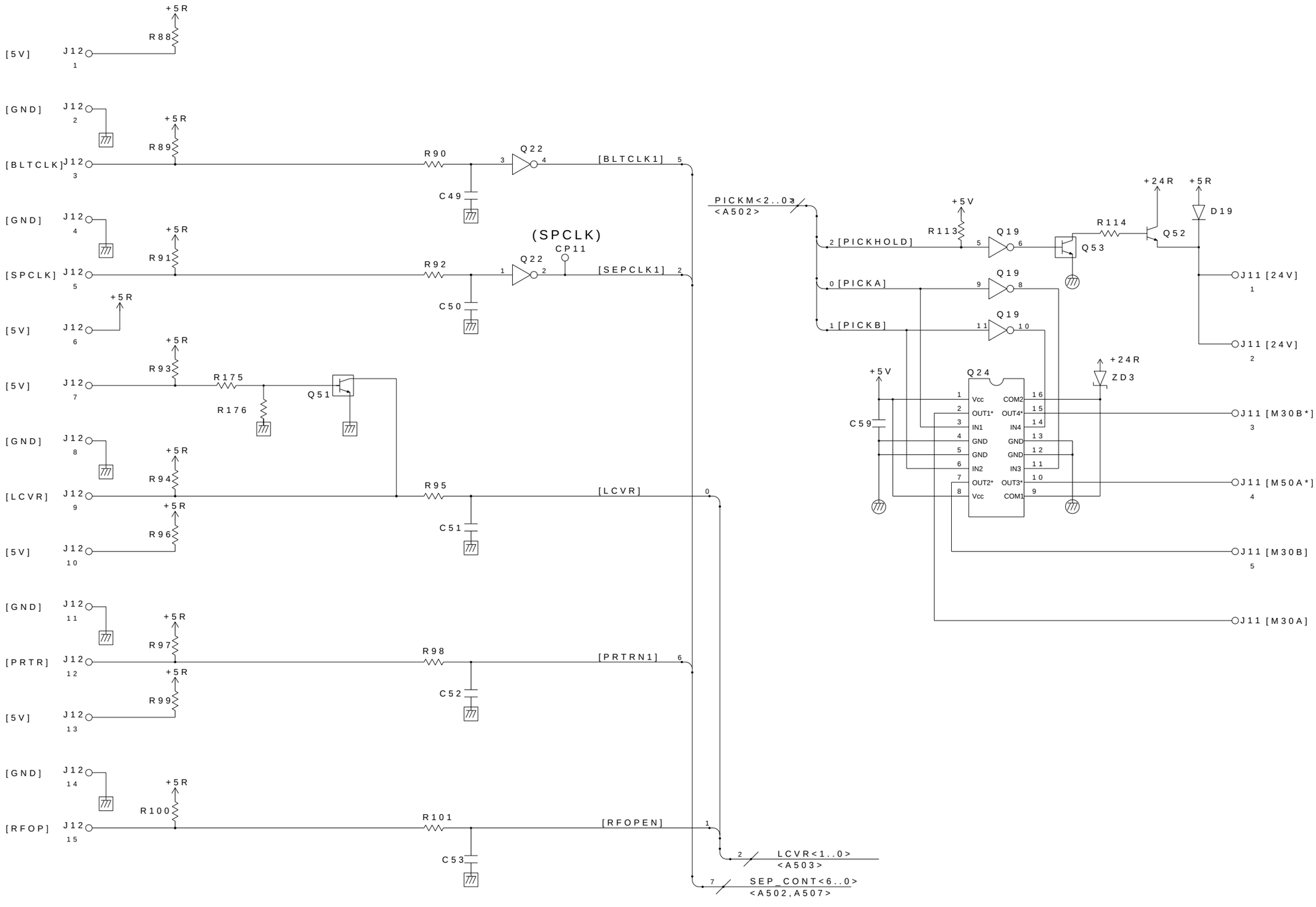
ADF Controller Circuit Diagram (8/11) A509



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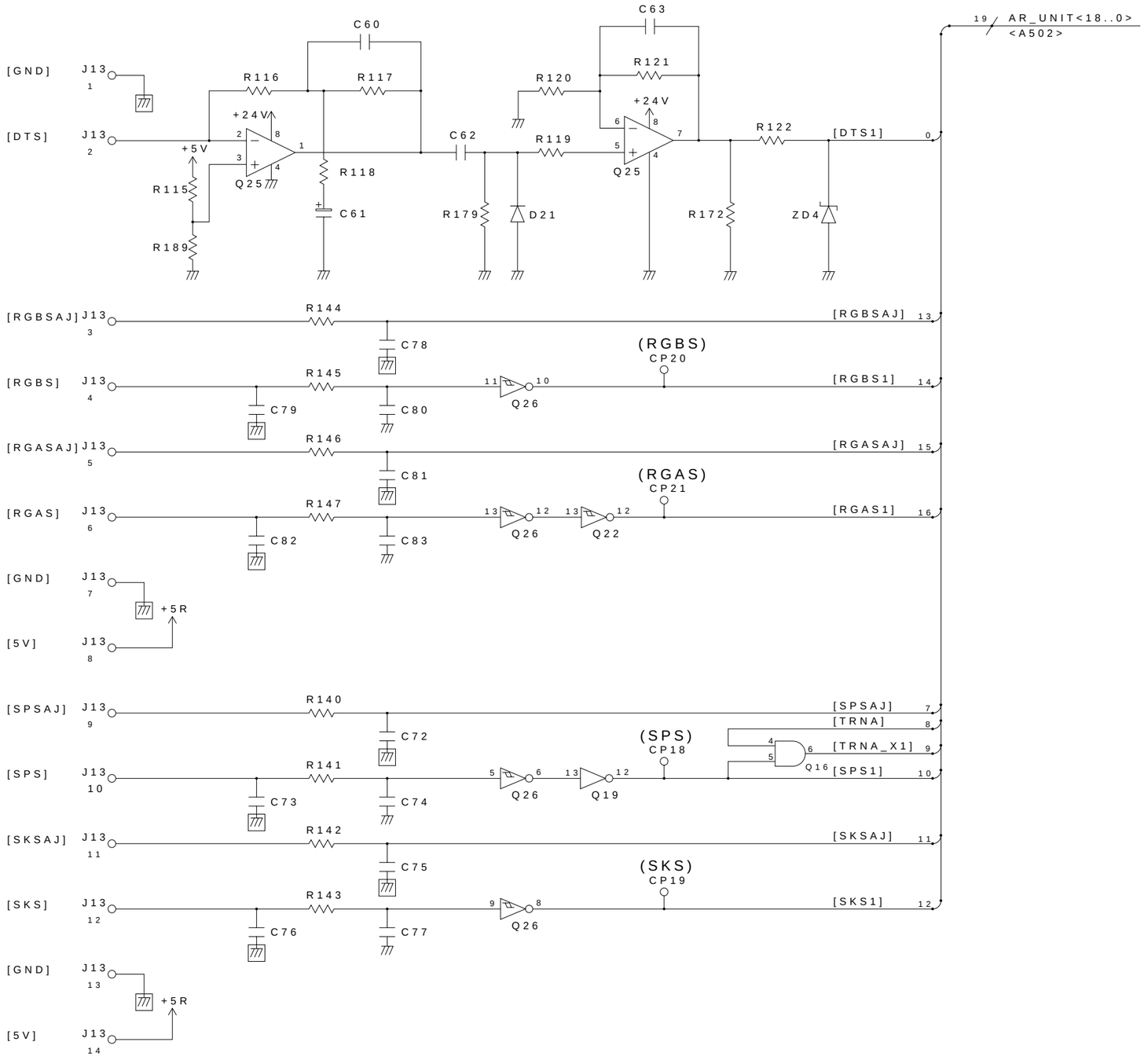

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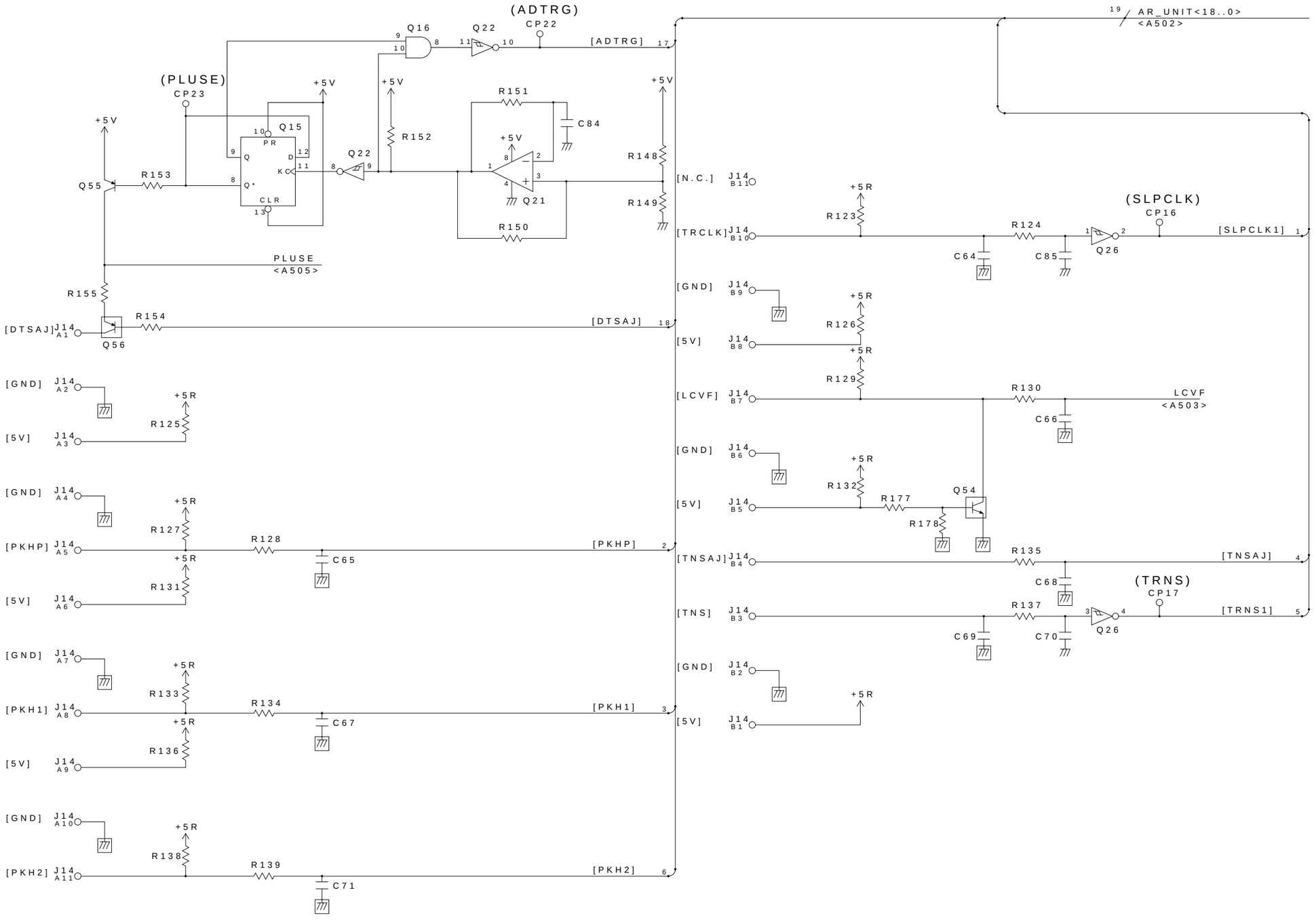
ADF Controller Circuit Diagram (10/11) A511



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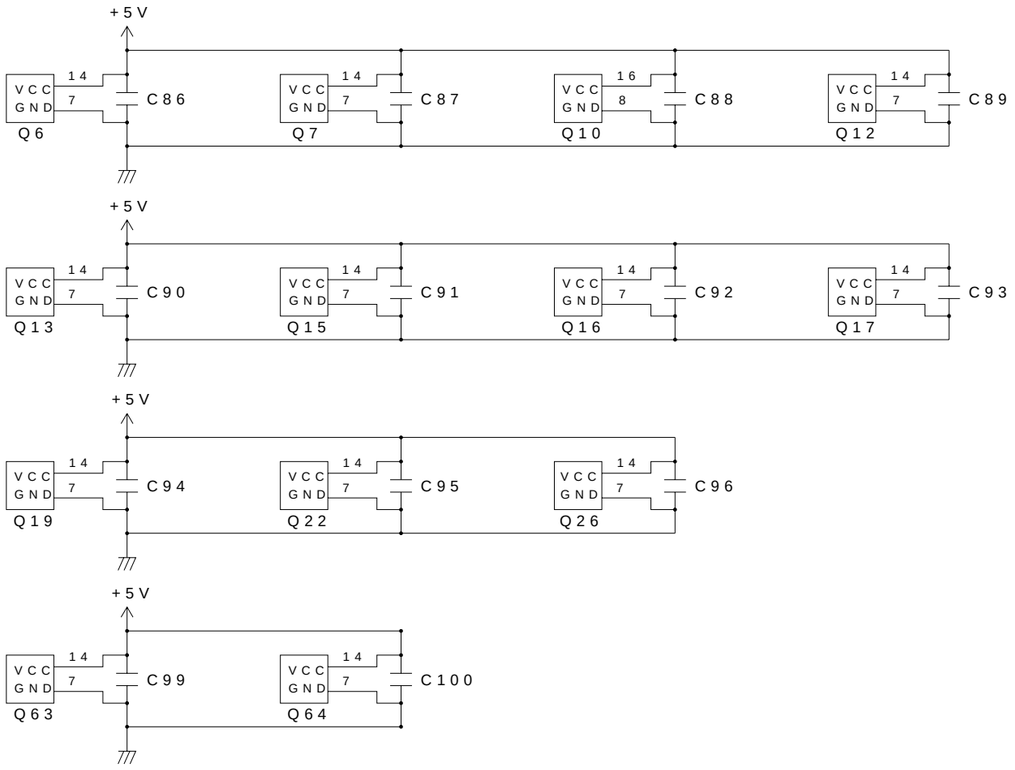
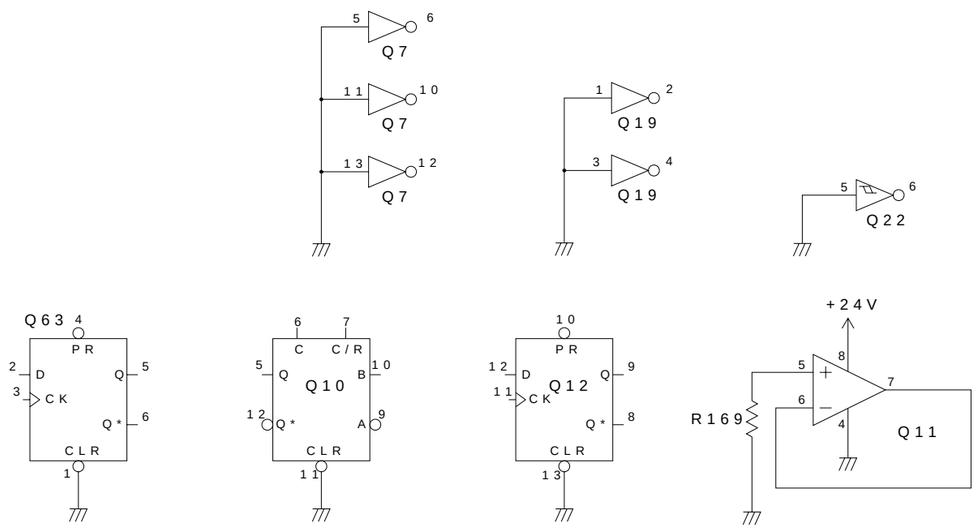
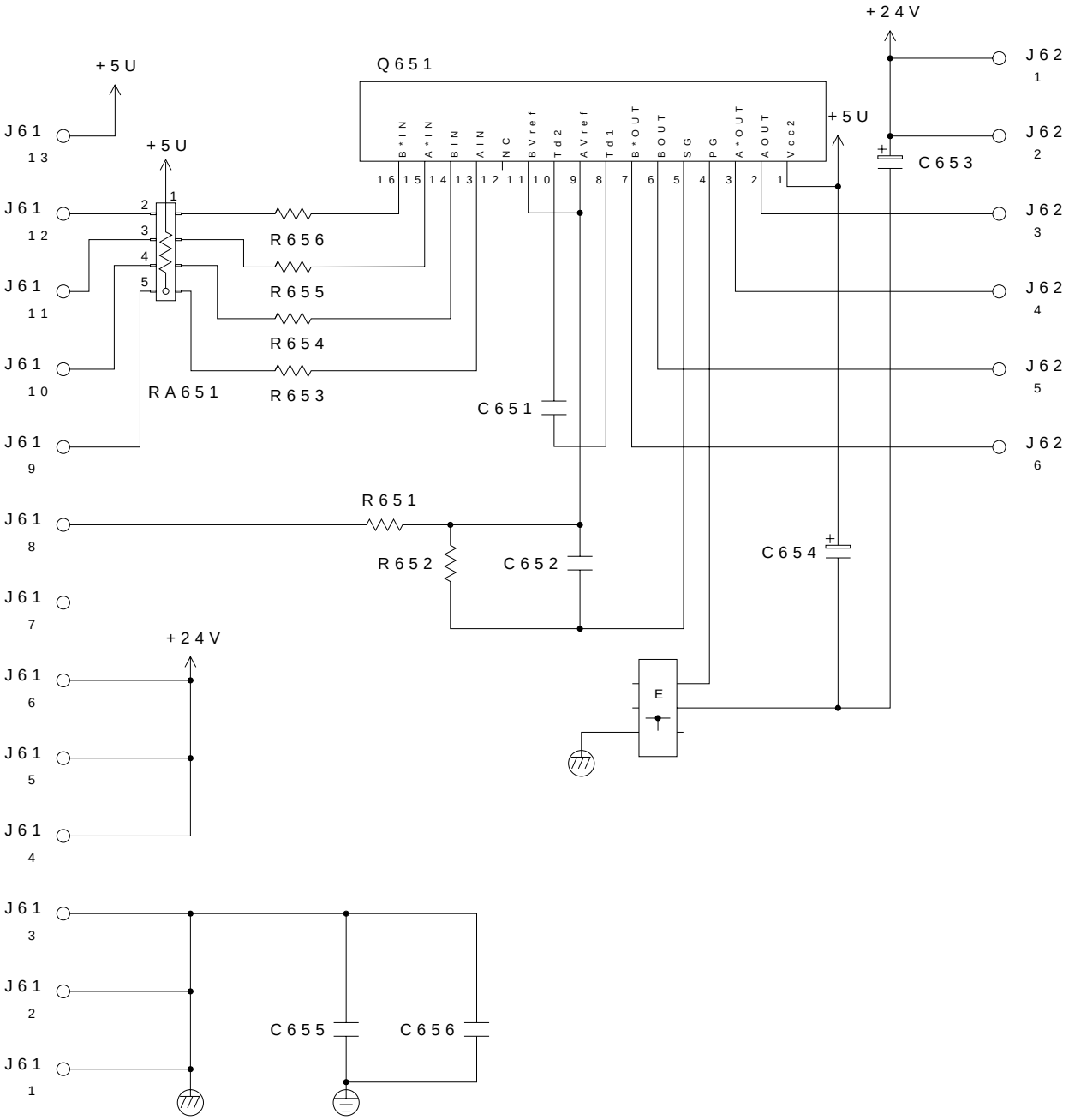
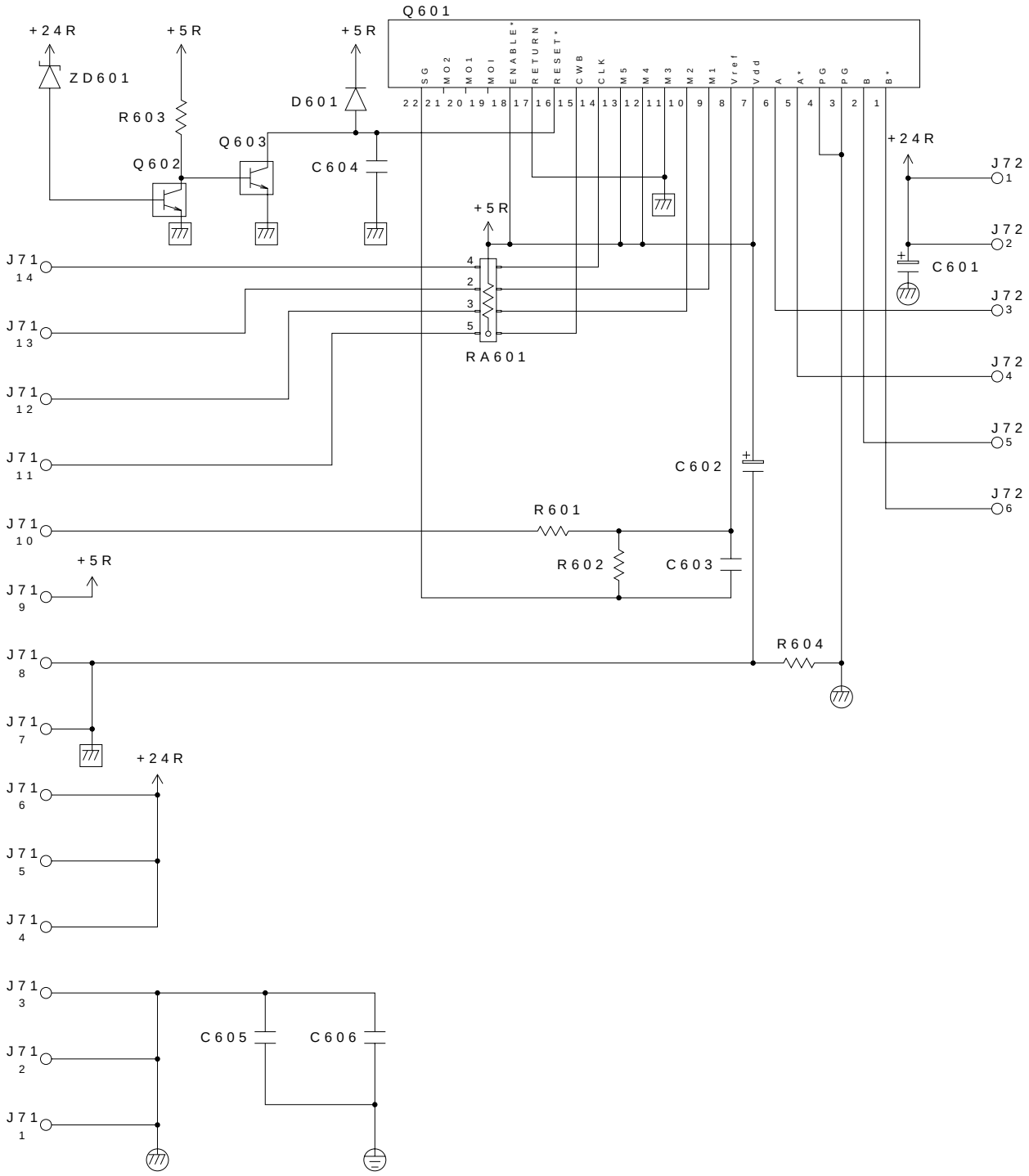

+5V
VCC
GND
14
7
16
8
C86
C87
C88
C89
Q6
Q7
Q10
Q12
C90
C91
C92
C93
Q13
Q15
Q16
Q17
C94
C95
C96
Q19
Q22
Q26
C99
C100
Q63
Q64


Q7
Q19
Q22
Q63
PR
CLR
D
CK
Q
Q*
C
C/R
B
A
Q10
Q12
+24V
R169
Q11

E. Reversal Motor Driver Circuit Diagram



F. Belt Motor Driver Circuit Diagram



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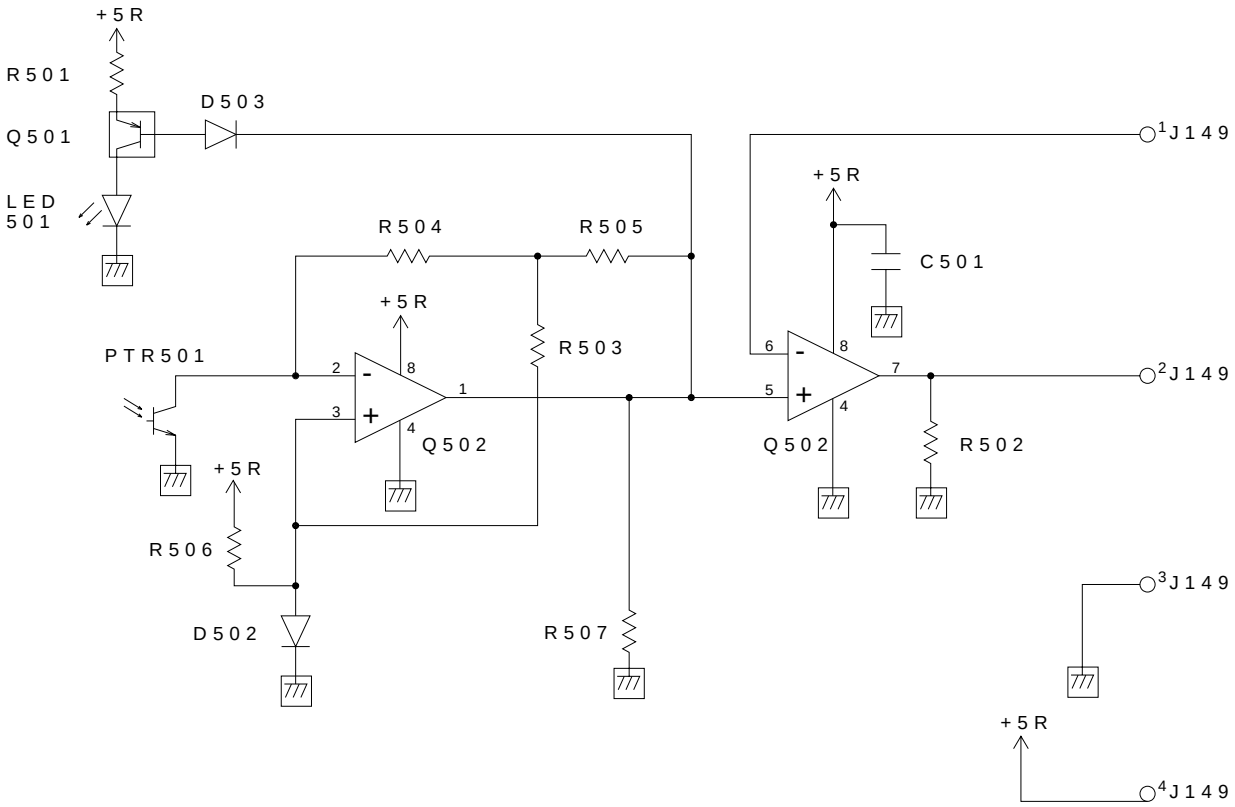
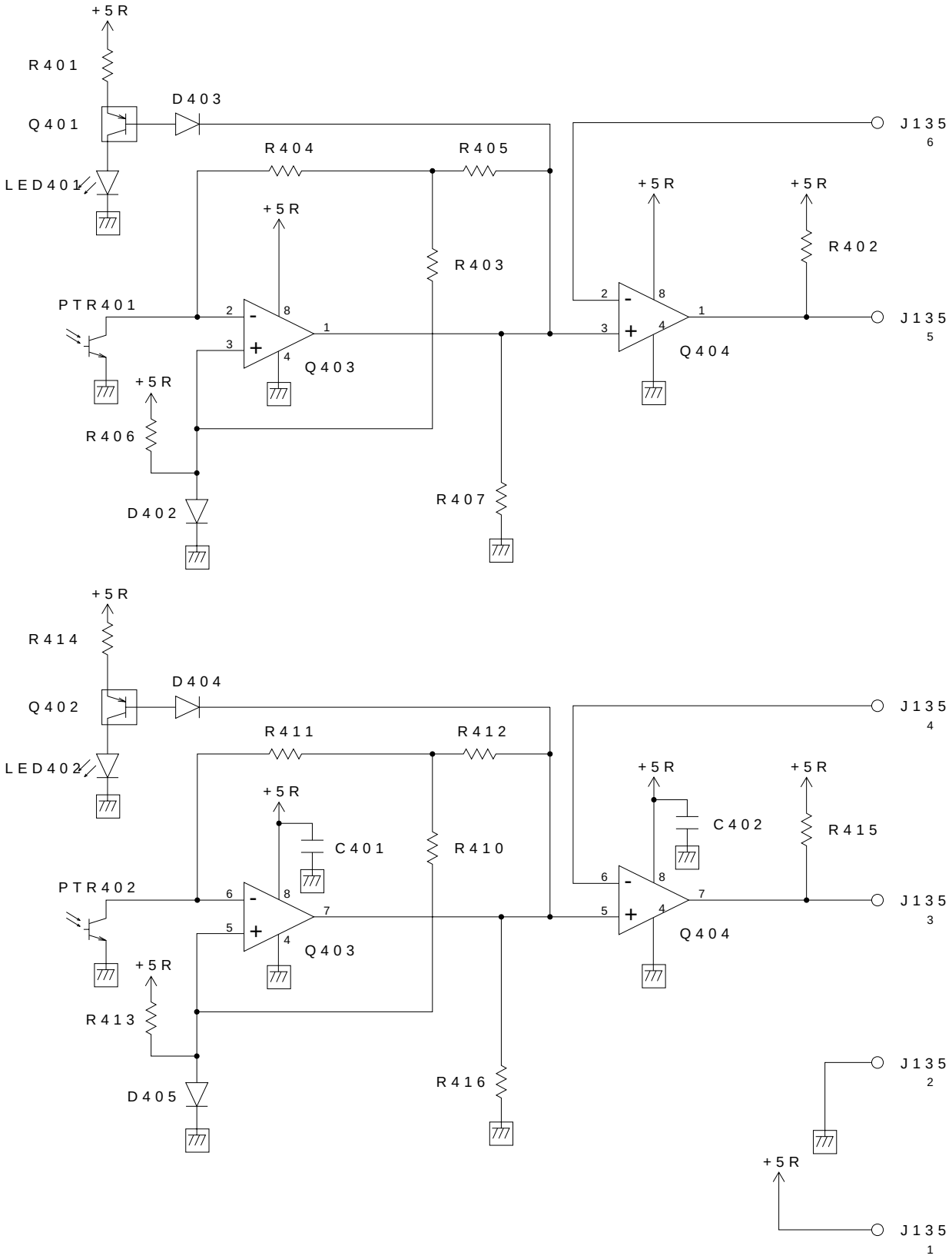
G. Reversal Sensor Circuit Diagram



H. Pre-/Post-Registration Roller Sensor Circuit Diagram



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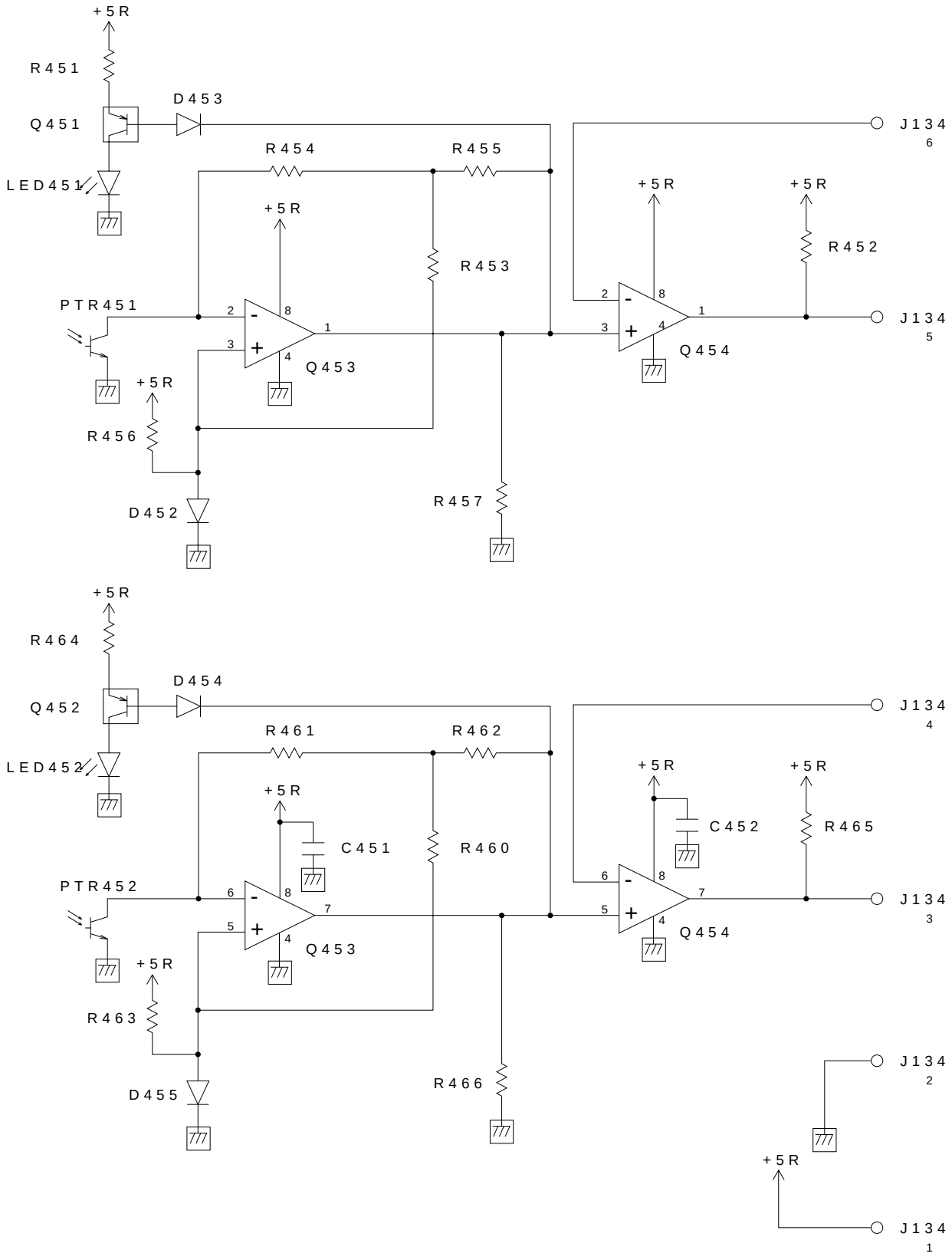
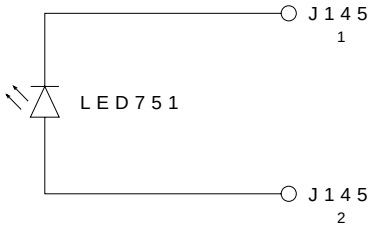
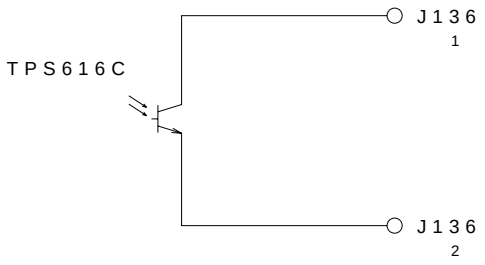
I. Separation Sensor/Skew Sensor Circuit Diagram



J. Original Sensor (light-emitting) Circuit Diagram



K. Original Sensor (light-receiving) Circuit Diagram



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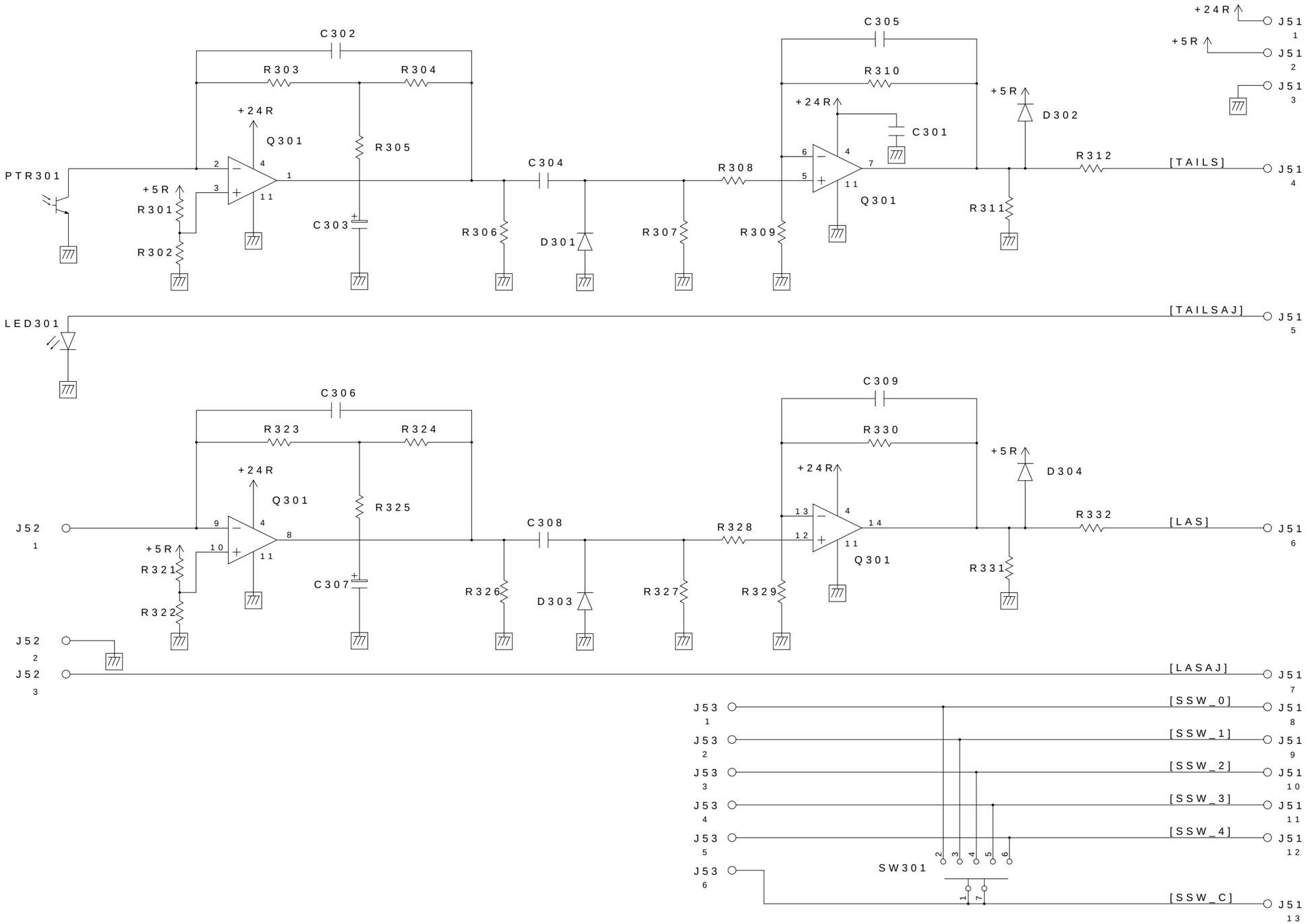
L. Tray Circuit Diagram



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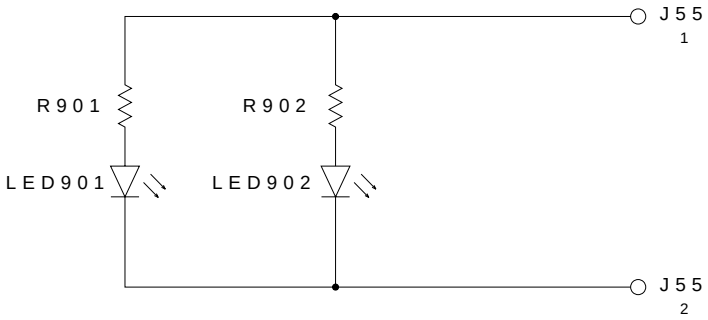
M. Pre-Last Original Paper Sensor Circuit Diagram

N. Original Set Indicator Circuit Diagram



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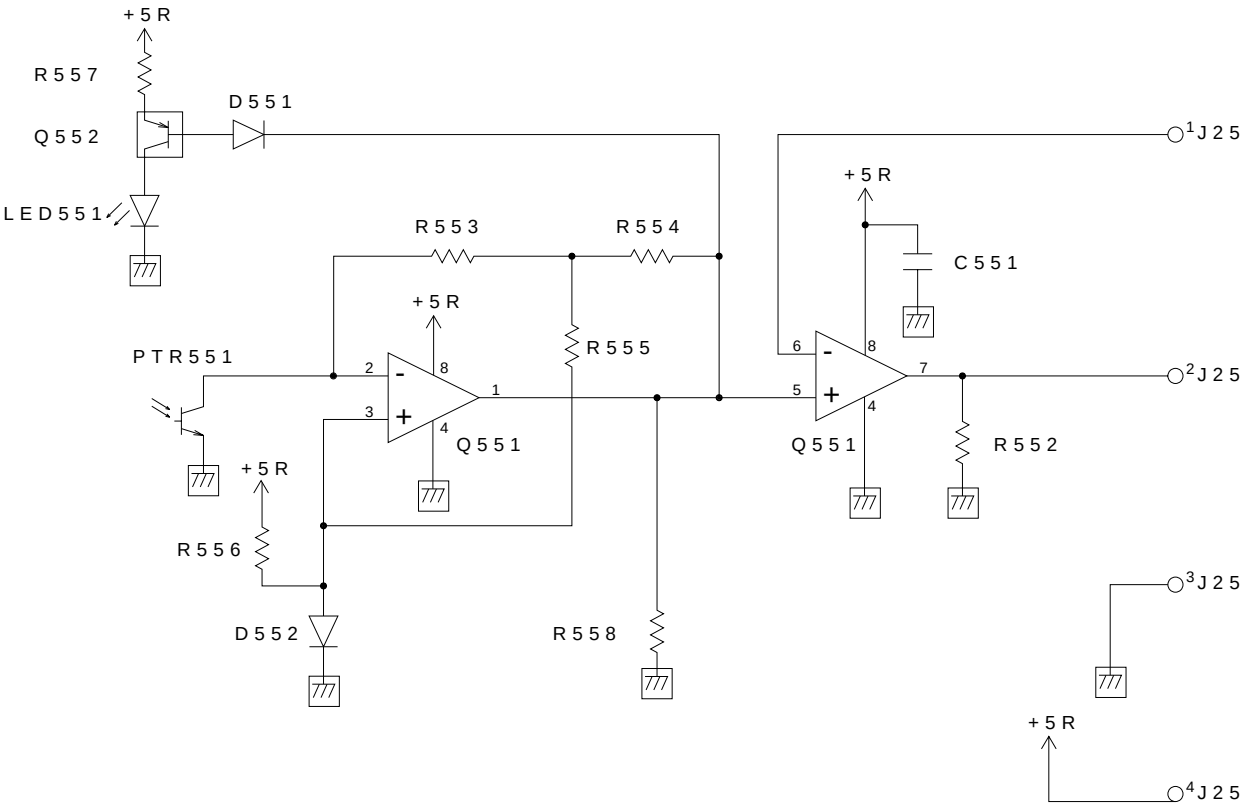
O. Manual Feed Registration Roller Paper Sensor Circuit Diagram



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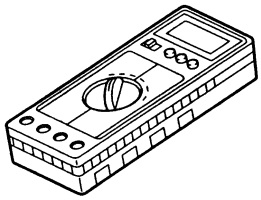
P. Special Tools

You will need the following special tool when servicing the machine in addition to the standard tools set

No.	Tool name	Tool No.	Shape	Rank*	Remarks
1	Digital multifeeder	FY9-2002-000		A	For making electrical checks

***Use the following as a guide:**

A: Each service person is expected to carry one.
B: Each group of five service persons is expected to carry one.
C: Each workshop is expected to carry one.

Q. Solvents and Oils List

No.	Name	Uses	Composition	Remarks
1	Alcohol	Cleaning; e.g., glass, plastic, rubber (external covers).	Fluorine-family hydrogen carbon, alcohol, surface activating agent	• Do not bring near fire. • Procure locally. • IPA (isopropyl alcohol)
2	Lubricant	Driving parts, friction parts	Silicone oil	CK-0551 (20 g)

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